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Provides estimates of full-time-equivalent staff needs in higher education in California for the period 1957–70; data covering certain characteristics of faculty appointees in higher education in California (geographic source, highest degrees held, etc.); estimates of probable in- and out-of-State supply of college faculty; suggestions for meeting staff needs; and conclusions and recommendations.

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1957-1970

Prepared for the Liaison Committee of The Regents
of the University of California and the
California State Board of Education

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A STUDY OF FACULTY DEMAND AND SUPPLY IN CALIFORNIA HIGHER EDUCATION 1957–1970

Prepared for the Liaison Committee of The Regents
of the University of California and the
California State Board of Education

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STATE OF CALIFORNIA
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October 21, 1957

To: The Liaison Committee of The Regents of the University of California and the State Board of Education

From: The Joint Staff for the Committee

Subject: Transmission of *A Study of Faculty Demand and Supply in California Higher Education, 1957–1970*

Within recent years in California and other states, much attention has been given to estimating future college enrollments and how such enrollments will be distributed among existing institutions. Because these estimates indicate that college and university enrollments will probably double within the next decade or so, attention has likewise been given to the physical facilities required for these expected students, either through the expansion of existing institutions or the establishment of new centers or both. On the other hand, relatively little attention has been given to a basic question in higher education, namely, what will be the source and quality of the staff which will be required to deal with these increased enrollments.

According to figures shown in the study here transmitted, the college-age population of California in 1973 will be over two and three-quarters times as large as that of 1950. Furthermore, the State, because of the extent to which it has developed its tripartite system of public higher education—junior colleges, state colleges and the University of California—has unique staffing problems. In the light of these and other similar factors, the Joint Staff believed it urgent to ascertain as accurately as possible the staff needs and the potential supply in the major subject fields in both public and private institutions in the State up to 1970. This need was discussed with the Liaison Committee at its meeting on February 9, 1957, when unanimous approval was given for the making of such a study.

The lack of data, particularly of data relating to the type of employment obtained by graduate-degree recipients in the several academic majors, made it necessary to make a number of tentative assumptions. While other assumptions might have been chosen, until more data are available, there is no assurance they would have improved the study. As the study developed, it became obvious that one recommendation would be that more and better national and state follow-up studies on graduate students are needed as a basis for further analysis and attack on the problems of providing an adequate number of qualified college and university faculty members. College faculties are the seed corn which provide the nation not only with new college faculty, but also with elementary and secondary teachers, research personnel for industry and government, those who fill the ranks of the other professions, and those others whose responsibilities require graduate preparation.

The Joint Staff wishes to express its appreciation to the graduate departments in both public and private institutions in the State for supplying information on the number of doctorates granted during the three-year period 1954 through 1956 and how many of that number became college teachers. Appreciation is also expressed to California college and university administrators, placement officers, and all others who assisted in any way in the making of this study.

Very cordially yours,

W. W. Semans

Specialist in Higher Education
State Department of Education

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University of California

NOTE: This report was reviewed by the Technical Advisory Committee to the Joint Staff at a meeting on October 28, 1957, and approval was given to it subject to a number of suggested modifications which have been incorporated herein. Certain tables and comments thereon have also been modified to make use of data not yet fully developed at the time of the Committee meeting. Subsequently, the report, as modified according to the recommendations of the Technical Advisory Committee, and on recommendation of the Liaison Committee, was approved by The Regents on November 15, 1957 with a different wording of Recommendation 1, and by the State Board of Education on November 22, 1957 with the wording of Recommendation 1 as given at the end of the report. On April 18, 1958, The Regents, on recommendation of their Committee on Educational Policy, accepted the wording of Recommendation 1 as given herein.

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Chapter I

GROWING NATIONAL CONCERN OVER THE SUPPLY OF QUALIFIED FACULTY TO MEET INCREASING COLLEGE ENROLLMENTS

Providing competent faculty in sufficient numbers to meet the growing college and university enrollments in the United States has been recognized recently as a critical problem of national importance. There has been a general awareness that the number of births in the United States has greatly increased during and since World War II, amounting to an increase from 2,360,399 in 1940 to 4,168,000 in 1956. The significance of these increases as they relate to higher education in the nation was first highlighted by a study made in 1953 by Ronald B. Thompson for the American Association of Collegiate Registrars and Admissions Officers entitled, *College-Age Population Trends 1940–1970*.[1] Later the findings of the study by Thompson were put in an illustrated booklet entitled *The Impending Tidal Wave of Students*,[2] which was widely distributed throughout the nation. The effects of this growth on numbers and source of faculty members, however, was not similarly recognized.

Growth of California's College-Age Population

The magnitude of the future growth of college-age population as it relates to California and other selected states, based on recent data from the U. S. Bureau of the Census, is shown in Table 1, Part A. The college-age population influences the number of potential college students and hence implies the consequent demand for college faculty. According to the table, between 1963 and 1968 California will have for the first time the largest college-age population of any state in the nation.

In addition to the relative magnitude of California's growth, there is the added problem of the extremely high rate of growth as shown in Part B of Table 1. According to these data, California's college-age population in 1973 will be nearly three times as large as in 1950 and will contain over two and three-quarter million 18- to 24-year-olds. If, according to California's previous experience, one-fifth of this potential enrolls in college, faculty will have to be provided to teach over 555,000 college and university students.

Student Migration in Western States

Little relief for California can be expected from expansion of facilities in other states, for related to the expected increase in college-age population as shown in Table 1 is the degree to which students attend college in their home states. In 1949–50 when the last study of student migration was made, it was

[1] Ronald B. Thompson, *College-Age Population Trends 1940–1970*, Columbus: The Ohio State University, 1953.

[2] Ronald B. Thompson, *The Impending Tidal Wave of Students*, Columbus: The Ohio State University, October, 1954.

TABLE 1

PROJECTION OF COLLEGE-AGE POPULATION (18 TO 24 YEARS) FOR SELECTED STATES
JULY 1, 1958 TO JULY 1, 1973
With Actual Figures for April 1, 1950
(In thousands. Figures relate to the civilian population plus members of the armed forces who resided in each state at the time of their entry into service.)

State	April 1, 1950	July 1, 1958	July 1, 1963	July 1, 1968	July 1, 1973	Per cent 1973 of 1950
Part A. Relative Magnitude						
(In order of decreasing magnitude in 1973)						
States with College-Age Population of One Million or More in 1973:						
California[1]	996	1,137	1,574	2,249	2,779	279
New York	1,530	1,333	1,596	2,045	2,333	152
Texas	870	858	1,010	1,312	1,567	180
Ohio	849	806	970	1,264	1,522	179
Pennsylvania	1,161	1,001	1,106	1,328	1,475	127
Illinois	885	817	971	1,212	1,423	161
Michigan	686	699	847	1,080	1,343	196
Part B. Relative Increase						
(In order of decreasing magnitude of percentage)						
States with College-Age Population in 1973 Two or More Times as Large as in 1950:						
Arizona	80	104	132	178	236	295
Nevada[1]	15	18	24	32	42	280
California[1]	996	1,137	1,574	2,249	2,779	279
Florida	287	324	424	586	734	256
Oregon[1]	149	168	215	290	340	228
Washington[1]	220	242	317	438	495	225
New Mexico	78	87	101	131	167	214
Maryland	244	252	328	441	513	210
Delaware	33	34	42	53	67	203
United States	16,070	15,481	13,055	22,790	26,360	164

Source: U. S. Bureau of the Census, *Current Population Reports*, Series P-25, No. 132 (February 20, 1956), prepared by Meyer Zitter.

[1] Projected migration rates for these states do not follow the uniform assumption of migration like 1940–50 used for other states. The net in-migration rate for the 18-24 age group for California was more than 50 per cent of the number in the group 10 years earlier in 1940. Therefore, the rates for California were reduced progressively so that they would yield net migration to California of about the same absolute magnitude as during the base period 1940–50. The in-migration rates for the 1940–50 period were 29 per cent for Washington and 36 per cent for Oregon. The rates were reduced by about one-half in line with 1950–54 declines in average annual rates. The migration rates for Nevada were also scaled down somewhat.

found that California ranked next to Utah among the western states in the percentage of its undergraduate students enrolled in institutions within the state. In addition to the fact that 93 per cent of undergraduate students from California attend colleges within the state, the number attending institutions outside the state (12,786) is roughly balanced by the number of students from other states enrolling in California institutions (11,809). The percentages for the 11 western states and for the nation as a whole, of those students attending in their home state are:

Western states	*Per cent*
Arizona	83
California	93
Colorado	86
Idaho	64
Montana	75
Nevada	58
New Mexico	73
Oregon	86
Utah	94
Washington	88
Wyoming	60
United States	81

Source: *Residence and Migration of College Students, 1949-50*, U. S. Office of Education, Washington, D.C.: Government Printing Office, 1951, Misc. No. 14, Table E.

State Studies of Expansion in Higher Education

Some measure of the extent of national concern over the problems of expansion in higher education is found in the fact that between 1953 when the Thompson study was completed and the end of 1955, 27 states completed or had under way statewide studies in the field of higher education.[8] Since that date, other states have authorized similar studies. An examination of several of these statewide studies shows that little direct attention has been given to staff needs in higher education, other than stating the need for expanding the facilities for perparing elementary and secondary teachers, and of making better use of present staffs, together with some general comments on the probable shortage of college teachers. These reports like most current literature in the field emphasize the great increases in expected enrollments, the physical plant needs and the problems resulting therefrom, admission requirements, and the like. Little is said about by what means and from where the academic personnel required for these greatly increased numbers of students will come.

Since 1955 there has been some evidence of growing concern over faculty staffing problems. Although the 1955 *Restudy of the Needs of California in Higher Education* devoted most of its space to other problems, it did call atten-

[8] E. V. Hollis and S. V. Martorana, "Advance Planning for Higher Education in the United States," *Higher Education*, Vol. XII, No. 7, March, 1956.

tion to the need for college teachers and included the following recommendation, which was approved by the State Board of Education on April 15, 1955, but has not as yet been passed upon by The Regents of the University of California:

"Therefore, it is recommended that institutions which prepare junior college, college, and university teachers examine the relevance of their graduate programs to the qualifications for teaching in various types of higher institutions, and their plans for recruiting qualified students for positions in these institutions. It is further recommended that colleges and universities, which will soon face shortages in their own staffs, examine the effectiveness of their utilization of present staff and of their teaching methods, as well as the possibility of higher retirement ages and the opportunities for professional growth and the adjustment of salary scales which may tend to hold some who might otherwise leave the profession."[4]

Nationwide Studies of Expansion in Higher Education

Other efforts have been made to point up this most critical problem of providing well-prepared staff in sufficient numbers for the expected enrollments. Most of these, however, have been on a nationwide basis and so reflect neither the varying needs of the different sections of the country, the varying needs in the different subject fields, nor the varying qualifications for the several types of higher education faculty. For example, Table 2 which follows is taken from the December, 1956, issue of *Higher Education* and shows only an estimate of total staff as related to enrollment in public and private institutions. It will be noted from the table that total actual staff for public and private institutions in 1955 was 327,000 different persons, including administrative, resident instructional, and organized research staffs. On an average ratio of one staff person to 8.26 students (the ratio for 1955 was one to 8.24), there will be required, as will be seen from the table, 566,000 faculty members in 1965. The recruitment problem, however, is represented by a number greater than the difference between 566,000 and 327,000, because of the replacements made necessary by resignations, retirements and deaths. The second most significant point in Table 2 is that the publicly controlled institutions anticipate greater growth and therefore relatively larger staff needs than do the private ones.

Staff increase because of growth would not be such a problem if the supply of faculty potential were adequate, but a number of factors limit the supply, including low birth rates and college enrollments during the 1930's (the years which produced much of the present reservoir of faculty), limited graduate facilities, and the competition of an expanding economy for personnel to perform research in industry and government, and to fill the ranks of other expanding professions. The incompleteness of the data on the percentage of graduate-degree holders entering college teaching makes estimates of the true supply tentative.

Genuine concern over this apparent lack of balance of supply with demand

[4] T. R. McConnell, T. C. Holy, and H. H. Semans, *A Restudy of the Needs of California in Higher Education*. Sacramento: California State Department of Education, 1955, p. 178.

TABLE 2

ACTUAL AND ESTIMATED RESIDENT FALL ENROLLMENTS AND SIZE OF STAFF IN INSTITUTIONS OF HIGHER EDUCATION IN THE CONTINENTAL UNITED STATES UNDER PUBLIC AND PRIVATE CONTROL

1945–65

(In Thousands)

Fall of	Total resident enrollment	Total staff[1]	Publicly controlled		Privately controlled	
			Enrollment	Staff[1]	Enrollment	Staff[1]
Actual						
1945	1,074	165.0	502	84.0	572	81.0
1947	2,339	224.0	1,153	112.9	1,186	111.1
1949	2,443	247.0	1,208	125.0	1,235	122.0
1951	2,102	246.0	1,038	137.7	1,064	108.3
1953	2,218	266.0	1,176	140.3	1,042	127.7
Estimated						
1955	2,695[2]	327.0	1,508[2]	183.0	1,187[2]	144.0
1957	3,104	375.0	1,738	210.5	1,366	164.5
1959	3,399	412.0	1,971	239.4	1,428	172.6
1961	3,790	459.0	2,274	276.0	1,516	183.0
1963	4,189	507.0	2,597	313.7	1,592	193.3
1965	4,677	566.0	2,946	357.0	1,731	209.0

Source: Robert E. Iffert, "Staffing Institutions of Higher Education in the Next Decade," *Higher Education*, Vol. XIII, No. 4, December, 1956, p. 66.

[1] Total number of different persons including administrative, resident instructional, and organized research staffs.

[2] Actual.

has resulted in some conferences, articles, and pamphlets. Some of these are listed below:

1. *Teachers for Tomorrow*, Bulletin No. 2, The Fund for the Advancement of Education. New York: 1955.
2. *Teacher Supply and Demand in Degree-Granting Institutions, 1954–55*, Research Bulletin, Vol. 33, No. 4, National Education Association. Washington, D.C.: 1955.
3. *Expanding Resources for College Teaching*, Series I Reports of Committees and Conferences, No. 60, American Council on Education. Washington, D.C., October, 1956.
4. "Special Report: Top Problem for U. S.—A General Shortage of Brainpower," *Business Week*, April, 1957.
5. *Teacher Supply and Demand in Colleges and Universities, 1955–56 and 1956–57*, National Education Association. Washington, D.C.: 1957.
6. "Facing the Teacher Shortage," *Higher Education in the West*, July, 1957.

7. "Crisis in the Colleges," *U. S. News,* June 14, 1957.
8. "Who Will Teach?" Chapter V, *Higher Education in a Decade of Decision,* Report of the Educational Policies Commission, National Education Association. Washington, D.C.: 1957.

The first resolution adopted by the Twelfth National Conference on Higher Education, sponsored by the Association for Higher Education, at its meeting in Chicago on March 6, 1957, was entitled "Staffing Higher Education" and reads as follows:

> The Twelfth National Conference on Higher Education urges that the Association for Higher Education and other interested organizations give further concerted study to the recruitment and preparation of faculty and proper utilization of their services.

The role of the graduate school in meeting the expected shortage of college teachers in the West was the theme of a conference sponsored by the Western Interstate Commission on Higher Education for 22 graduate school deans, August 8–10, 1957, in Santa Fe, New Mexico. A region-wide study of college teacher supply and demand was recommended.

In an "Informal Survey of Junior College Problems" in California, a report prepared by Hugh G. Price of the State Department of Education under date of October 9, 1956, it was found that 48 junior college administrators regarded "recruitment, training and employment of well-qualified junior college teachers" as the most serious of the problems faced by these junior colleges. Quoted from that report is the statement:

> Apparently scarcity of well-qualified personnel is already being felt and administrators want this problem to be studied and solutions to the problem proposed. It may be expected that this problem will get worse before it gets better, when the 'tidal wave' of students really hits.

In addition to the above-mentioned items, there are some pertinent studies in progress or proposed, including:

1. The U. S. Office of Education has undertaken an extended study of "Staffing the Nation's Colleges and Universities." (See *Higher Education,* September, 1957.)
2. The National Academy of Science—National Research Council, Office of Scientific Personnel, is studying earned Ph.D.'s in the United States from 1936 to date. A report is expected shortly.

In view of the fact that, according to the data in Table 1, California will experience between 1950 and 1973 the largest and one of the most rapid increases in college-age population of any state, plus the further fact that there are now no estimates available on the staff needs in higher education in California for that period, either in total or by major subject fields, the Joint Staff concluded that there is urgent need to develop such estimates both of the State's over-all need and by major subject fields.[8]

[8] This latter point has been stressed repeatedly by Dr. Lloyd D. Bernard, Manager, Bureau of School and College Placement, University of California, in statements to the Junior College Association and elsewhere. It is his belief that in so doing, the subject-field departments would have effectively brought to their attention the training job ahead for them.

Estimates of Future Enrollments in California Higher Education

The estimates of enrollments in California state colleges and the University of California, as shown in Table 3 of this study, are as of February 7, 1957, and were prepared by a thoroughly competent demographer, Dr. Carl M. Frisen, on the staff of the State Department of Finance. The junior college and the private college and university enrollments were estimated by the Joint Staff. In addition, Department of Finance projections of public high school graduates were used by the Joint Staff to estimate total college enrollments through 1970–71 by means of ratios of total college enrollment to projected public high school graduates.

Joint Staff estimates of junior college and private college enrollments necessarily were arrived at somewhat arbitrarily in relation to given state college and University enrollments, within the previously derived estimates of total college enrollment. Full-time enrollments are defined as 12 or more units for all segments of higher education.

It will be noted in Table 3 that state college enrollments are projected as an increasing *proportion* of total college enrollments in line with 1950–1956 experience. University of California enrollments are projected at approximately a constant proportion of total college enrollments as a leveling off of the 1950–1956 trend. Private college enrollments are projected according to a survey of private college and university enrollment policies and estimates for 1965 and 1970, as submitted confidentially to the Joint Staff. The projections indicate a constant numerical increase but also a declining proportion of total college enrollments.

Public junior college enrollments are projected in Table 3 with rather large numerical increases although the percentage of total college enrollments, after a large increase to 1960, levels off and decreases slightly to 1970. No particular significance is to be attached to the declining percentage of total enrollment indicated for junior colleges between 1960 and 1970. This is rather an arithmetical outcome of fitting the enrollment estimates for all four types of institutions into a previously computed total college enrollment. It should further be kept in mind that the two-year junior colleges are here related in percentage to the four- (and more-) year state colleges and other colleges and universities. When the estimated increases for 1970–71 are related in numbers to the actual enrollments of 1956–57, it is found that the junior colleges show an increase of 43,056 more than the increase of the state colleges.

It should be observed also that both the state colleges and the University of California are expected to concentrate more heavily on upper-division and graduate work in the future, with the junior colleges caring for more of the lower-division enrollments. In the Fall of 1955, the public junior colleges enrolled 58.8 per cent of all full-time lower-division students in California. In the Fall of 1956, the per cent was 59.0.

As noted in the letter of transmittal, when the need for a study of collegiate staff required to care for these enrollments was presented to the Liaison Committee of the Regents and the State Board of Education on February 9, 1957, unanimous approval was given to this project.

TABLE 3

FULL-TIME COLLEGE ENROLLMENTS BY TYPE OF INSTITUTION, AND PUBLIC HIGH-SCHOOL GRADUATES IN CALIFORNIA: ACTUAL, 1950-51 THROUGH 1956-57, AND ESTIMATED, 1957-58 THROUGH 1970-71

Academic Year	Public junior colleges		State colleges		University of California		Private colleges		Totals		Public HS grads. (prior yr.)	Ratio: college enrollment/high school grads
	Number[1]	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent[2]		
1950-51	56,624	34.8	25,369	15.6	39,492	24.3	41,036	25.2	162,521	100	73,992	2.196
1951-52	48,674	33.8	24,160	16.8	34,883	24.2	36,446	25.3	144,163	100	74,026	1.947
1952-53	52,818	36.6	25,162	17.4	33,326	23.1	33,120	22.9	144,426	100	74,645	1.934
1953-54	52,142	35.6	24,712	16.8	32,636	22.2	37,167	25.3	146,657	100	77,780	1.886
1954-55	63,019	38.7	29,487	18.1	32,563	20.0	37,847	23.2	162,916	100	84,226	1.934
1955-56	70,165	38.7	33,910	18.7	37,035	20.4	40,003	22.1	181,113	100	90,760	1.995
1956-57	74,082	38.5	38,338	19.9	37,522	19.5	42,396	22.0	192,338	100	96,960	1.984
(Estimated)												
1957-58	82,700		42,700		42,400		44,000		211,800		106,000	
1958-59	87,700		46,700		44,500		46,000		224,900		112,200	
1959-60	97,800		50,800		46,800		48,000		243,400		121,600	
1960-61	118,800	43.2	56,400	20.5	50,000	18.2	50,000	18.2	275,200	100	140,400	1.960
1961-62	126,800		62,900		54,300		52,000		296,000		149,400	
1962-63	129,700		69,300		58,400		54,000		311,400		152,500	
1963-64	128,300		75,300		62,600		56,000		322,200		154,200	
1964-65	160,200		83,000		68,000		58,000		369,200		183,100	
1965-66	165,400	42.7	89,700	23.2	72,100	18.6	60,000	15.5	387,200	100	188,500	2.054
1966-67	178,500		98,300		76,800		62,000		415,600		203,000	
1967-68	183,300		107,500		82,000		64,000		436,800		212,900	
1968-69	177,500		114,900		88,000		66,000		446,400		210,700	
1969-70	190,000		122,700		91,700		68,000		472,400		225,000	
1970-71	209,200	41.3	130,400	25.8	96,400	19.0	70,000	13.8	506,000	100	241,200	2.098

Source: Estimates for the state colleges and the University are based on Department of Finance enrollment projections of February 7, 1957 and projections of public high school graduates. Estimates for public junior colleges and private colleges were prepared by the Joint Staff. Full-time enrollment is 12 or more units.

[1] Includes full-time unclassified minors and adults.

[2] Sum of parts may differ from total due to independent rounding.

Chapter II

PURPOSES AND GENERAL PLAN OF STUDY

In broad outline, it is the purpose of this study to answer, in part at least, the following questions:

1. How many new full-time-equivalent staff members are estimated to be needed by 1970, in selected subject fields and in total, by the junior colleges, state colleges, University of California and private colleges and universities in the State?

2. What are the characteristics of faculty at the time of first appointment with respect to highest degree held, source of recruitment, rank to which first appointed and institution from which doctorate was received?

3. What supply can be expected nationally and from California institutions in terms of holders of master's and doctor's degrees by fields and what percentage of these degree holders will go into teaching?

4. In which fields is an oversupply, balance, or undersupply anticipated?

5. What suggestions have been made to provide adequate numbers of faculty without undue sacrifice in quality of instruction?

Assumptions

In making any study such as this, or in fact making any projections into the future, it is necessary to assume that certain things are true or probable. Often the degree of probability that assumptions will become actualities is not as great as desired, but in the absence of more complete data or data showing trends, no greater degree of probability is assured through alternative assumptions.

The assumptions which follow are grouped into three separate categories: (1) general ones, (2) those underlying the future demands for college faculty, (3) those relating to supply of collegiate faculty.

1. *The major assumptions of a general nature underlying this study—*

a) Enrollment projections by the Department of Finance, dated February 7, 1957, for the state colleges and the University of California, and the estimates derived from them by the Office of the Specialist in Higher Education of the State Department of Education for enrollments in the private colleges and universities and for the public junior colleges, will all prove to be close to the actualities in the future.

b) Admission and retention policies will not be changed enough to affect student enrollment significantly.

c) Within the period covered, institutional offerings and enrollment distribution, including distribution by lower division, upper division, and graduate levels, will not change enough to affect these projections appreciably.

d) New facilities needed will be provided in time to meet the demand for graduate enrollment increases as well as for undergraduate enrollment growth.

2. *The major assumptions underlying the estimates of future demand for college faculty in California—*

a) The ratio of full-time-equivalent staff to students, and the distribution of students and of such staff among the subject fields and lower division, upper division, and graduate levels, will continue as in the Fall of 1953, the latest year for which there are complete data of this kind for California institutions.

b) Research, public service and teaching activities will remain in the same proportions for full-time-equivalent staff, where such activities are a factor in these projections, as in 1953.

c) Technical developments such as the use of TV for teaching large classes or for using skills of master teachers will not significantly decrease staff needs.

d) Replacement of annual loss of staff for all causes (retirement, resignation, death, etc.) will require each year the employment of new staff amounting to 8 per cent of the total staff of the prior year in the state colleges and junior colleges. This estimate is based on a sampling of separation documents. For the University of California, there was, according to the Academic Retirement Office, a loss of 6 per cent for the calendar years 1955 and 1956, so this lower per cent was used in the University projections. This same per cent was assumed for private colleges and universities.

e) Through increased effort in recruitment, the institutions of higher education in California will maintain their present standards for appointment, i.e., appoint at similar academic ranks approximately the same per cent of doctors and masters as in the past.

3. *The principal assumptions related to the supply of collegiate faculty for California institutions—*

a) The number of future doctor's and master's degrees awarded will bear, respectively, the same approximate relationship to future full-time enrollments as in the past.

b) Of those receiving graduate degrees in the future, the same proportion will be awarded in each subject field as in the past.

c) The per cent of the degree holders in each subject field who enter college teaching and research will remain constant.

d) California will be able to recruit from the supply of potential faculty members outside of California sufficient numbers to equal approximately 50 per cent of the State's needs for faculty. Because of California's relative rate of growth, this number may prove to be an increased per cent of the probable future national supply.

e) The balance of the faculty needed in California will be recruited from graduate-degree holders in California not now engaged in college teaching, or will be produced by California's own public and private colleges and universities.

Sources of Data

The basic data used in this study came principally from the following sources:

1. IBM data gathered for *A Restudy of the Needs of California in Higher Education*,[1] which give the number of full-time-equivalent staff members by subject fields in the junior colleges, state colleges, University of California, and a sampling of private colleges and universities for the Fall of 1953.
2. State Department of Finance college enrollment projections as of February 7, 1957 for the state colleges, the University of California, and public high school graduates for each year up to 1970.
3. Estimates derived from the above figures by the Office of the Specialist in Higher Education of the State Department of Education for projected enrollments of public junior colleges, private colleges and universities, and also for total college enrollment, for each year up to 1970.
4. The Fall of 1953 full-time college enrollment data as found in *A Study of the Need for Additional Centers of Public Higher Education in California*.[2]
5. Questionnaire returns from selected college and university placement officers on placements and estimates of the relationship of supply to demand for college teachers by field.
6. U. S. Office of Education Circulars on *Earned Degrees in Higher Educational Institutions*.[3]
7. Personnel data from the Bio-Bibliographical Service, University of California and from the Personnel Office, California State Department of Education.

Methods of Procedure

The basic data on future need for faculty in California from the above sources were treated in this manner:

1. Annual enrollment projections for each of the four segments of higher education were converted into quotients by dividing each by the actual enrollment for 1953. For example, the projected enrollment for the University of California for 1960 is 50,000, compared to an actual enrollment of 32,636 in 1953. The quotient obtained by dividing 50,000 by 32,636 is 1.5320.
2. These quotients were used as multiplying factors in projecting staff needs for each year, applying them to 1953 staff totals for each of the subject fields in each segment, and to the total staff for all subject fields in each segment. For example, the total number of the 1953 engineering staff of the University, which was 245, was multiplied by the quotient of 1.5320 to obtain a projected staff figure of 375 for 1960.
3. Having obtained these projected staff totals for each year to 1970, the difference between years was computed by subtraction. The figures thus obtained

[1] T. R. McConnell, T C. Holy, and H. H. Semans, *A Restudy of the Needs of California in Higher Education*. Sacramento: California State Department of Education, 1955.
[2] H. H. Semans and T. C. Holy, *A Study of the Need for Additional Centers of Public Higher Education in California*. Sacramento: California State Department of Education, 1957, p. 114.
[3] *Earned Degrees in Higher Educational Institutions*, U. S. Office of Education, Circular Nos. 333, 360, 380, 418, 461 and 499. Washington, D.C.: Government Printing Office, 1950–51 to 1955–56.

showed the change in staff total required each year to keep the staff in the same relationship to the student enrollment projections as in 1953. For example, the staff needed in engineering for 1961 at the University of California was estimated at 408, an increase of 33 over the 1960 figure of 375 mentioned in (2) above. In some instances there are decreases for a year or two in this group of figures, but they were offset usually by the new staff needed for replacement.

4. The number needed to cover loss by resignation, retirement and death each year was computed by applying the appropriate per cent to the prior year's staff (6 per cent for the University of California and private institutions, 8 per cent for the others). For example, 6 per cent of the projected staff of 375 needed for engineering in 1960 is 22.

5. The data derived in (3) and (4) above were combined to produce estimates of the total new staff needed for each year. For example, in 1961 as compared with 1960, the University will need 33 new staff members in engineering to keep in step with increased student enrollment plus another 22 for replacement of loss by resignation, retirement and death from the prior year's staff, or a total of 55 new staff to be hired between the two academic years.

6. An analysis of the IBM data mentioned under Sources of Data (1) showed that the preponderance of the instruction given in the four segments of California higher education was offered in 26 subject fields. Consequently, the above calculations were limited to those fields. However, all four segments do not offer instruction in all these 26 subject fields, so only those in which instruction is offered are included in the tables showing staff needs in each. (See Chapter III for these tables.)

7. The staff needed for the subject fields other than the 26 mentioned in (6) above was calculated in the following manner: The total staff needed for each segment of California higher education was calculated in the same manner as for each of the 26 subject fields, and from that total there was subtracted the sum of the staff needed in these 26 subject fields.

The computations made for Chapter III therefore produced two sets of significant figures out of the many columns of worksheet data. These were: The *annual estimated staff totals for each year to 1970*, and the *annual new staff needed to maintain these estimated requirements.*

The characteristics of new appointees to the University of California and the state colleges which are shown in the tables in Chapter IV were prepared when possible by year for 1954, 1955, and 1956, in order to show any trends which might influence the potential supply estimates in Chapter V. Data on the per cent of doctor's and master's degree holders among new appointees in the California junior colleges were available only for 1957. Data from one of the large private universities led to the assumption that the characteristics of private institution faculties approximate those of the University of California and the state colleges.

The data basic to estimates of future supply for California are less complete than are those on demand. The principal gap is found in the lack of data on how many of those with graduate degrees in a given field will enter college and university teaching in California. That there was large variation among the

fields was certain, but even approximate per cents of variation were not known; therefore, it was necessary to obtain the data and opinions on true supply of college faculty potential from placement officers and from department heads who are believed to be in the best positions to indicate true supply and the proportion of that supply which can reasonably be expected to accept appointments in California institutions.

Data in Chapter V were assembled to present a picture of the total number of doctor's and master's degrees in 26 subject fields granted nationally and in California. These data give some measure of California's effort to meet its own needs by fields. Further analyses of these data show the sources of California's supply of potential faculty and the trends in the number of degrees awarded by the several graduate institutions in the State.

By applying the ratios of past graduate degree recipients and past enrollments to the projected enrollments of the California institutions with graduate programs, it was possible to estimate the future total number of degree recipients which reasonably may be expected. This potential total supply was converted to an estimated true supply by degree level of those from California institutions who seek college faculty appointments both out-of and within California. Comparison of estimated net demand by type of institution with estimated net supply by type of institution and by subject fields was possible for the period 1955 to 1970 for existing institutions. To the net demand for faculty in existing institutions there should be added later a total figure representing additional faculty needed to staff the four state colleges authorized in 1957, and the three new University of California general campuses approved by the Regents in 1957. These new institutions presumably will be caring for their estimated potential enrollments by 1970, but will not have been established long enough for their graduates to make any corresponding and significant contribution to the potential supply of college faculty members.

Chapter III

ESTIMATES OF FULL-TIME-EQUIVALENT STAFF NEEDED IN HIGHER EDUCATION IN CALIFORNIA FOR THE PERIOD 1957–1970

The Joint Staff believes it necessary to emphasize strongly to public school, college and university officials, governing boards, and others directly involved, that concerted effort must be made in recruiting and educating college teachers if colleges and universities are to be staffed adequately in the years ahead. The size of the problem is indicated in Tables 4 through 8 which show the total full-time-equivalent staff needed, by subject field, for each of the segments of higher education in California, for the Falls of 1960, 1965 and 1970, and the total *new* staff needed during the periods 1957–60, 1961–65 and 1966–70. A final column is included in these tables which shows the grand total of new staff needed for the period 1957 through 1970.

Tables 4 through 7 are similarly organized and contain the same kinds of information for each of the four segments of higher education in the State, and the following explanations apply alike to all four.

Components of Certain Subject Fields

1. Certain of the subject fields listed in these tables include subfields or departments which may or may not be generally so classified. For this reason the components of these particular subject fields are listed below. Insofar as possible similar classifications were developed for Tables 23, 24, 27, and 29.

Agriculture in these tables includes: agricultural economics, agronomy, animal husbandry, dairy industry, entomology, food technology, forestry, genetics, horticulture, landscape architecture and management, plant biochemistry, plant nutrition and pathology, poultry husbandry, soils, veterinary medicine and science, and agriculture not elsewhere classified. Some courses in these subjects may also be offered in other departments; for example, genetics in zoology and botany departments.

Arts and Crafts includes: architecture, art, city and regional planning, crafts, decorative arts, graphic arts, photography, radio, television, and fine and applied arts not elsewhere classified.

Biological Sciences includes: biochemistry, biology, botany, fisheries and wildlife management, zoology, and biological sciences not elsewhere classified. Medical sciences are classified under "*All Other Subject Fields.*"

Business Administration and Education includes those business subjects generally taught in four-year institutions, but excludes economics which is in a separate category.

Commercial Arts includes some of the same subjects included in business administration and business education, but the category applies primarily to

junior colleges. Business skill subjects are included in the junior college commercial arts category.

Mathematics includes general statistics.

Romance Languages includes French, Italian, Portuguese, and Spanish.

Positions Included under "Staff"

2. The kinds of staff positions reported in Column 1 of Tables 4 through 7 are those including teaching, research, public and professional service, departmental administration, and departmental contributions to institutional administration. Excluded are non-faculty personnel, and positions in separately organized and budgeted research and institutional administration except as noted above.

Total Staff Needed

3. The figures in Columns 2, 3, and 4 show for each of the 26 subject fields and for "all other subject fields" the total number of full-time-equivalent staff required in 1960, 1965, and 1970, respectively. These have been calculated in accordance with the explanations found under the heading *Methods of Procedure* in the preceding chapter.

New Staff Needed

4. The figures in Columns 5, 6, and 7 show the number of *new* full-time-equivalent staff members who must be employed during the period 1957–1960, 1961–1965, and 1966–1970, respectively, in order to maintain the faculty at the level of staffing shown in Columns 2, 3, and 4. Column 8 is the sum of Columns 5, 6, and 7, and thus represents the number of new full-time-equivalent staff needed by segment of higher education and by subject field between 1957 and 1970.

Table 8 summarizes the total number of new full-time-equivalent staff needed in California by subject fields and the number and percentages needed by types or segments of higher education for the period 1957–1970.

Table 9 summarizes the figures on total staff required and the new staff needed to maintain these requirements in the junior colleges, state colleges, University of California and private institutions for the period 1957–1970. It will be seen from Part A of this table that the staff requirement for the state colleges in 1970, as compared with the actual number in 1953, represents the highest percentage of growth among the four segments. That percentage is 528 for state colleges, while for the junior colleges it is 413, for the University of California 295, and for private colleges and universities 188. When all four segments are combined the percentage is 339.

Part B of Table 9 brings together from Tables 4 to 8 the new staff needed to maintain the staff requirements as shown in Part A of the table. These figures, as earlier noted, include the additions necessary to offset retirements, resignations, deaths, and separations from service for other causes.

A number of comparisons could be made showing the extent of the staff needs as here estimated. In summary, it is observed that the total full-time-equivalent staff in all four segments in the Fall of 1953 was 9,927. In order to maintain the

TABLE 4

ESTIMATES OF FULL-TIME-EQUIVALENT STAFF NEEDS BY FIELD IN CALIFORNIA JUNIOR COLLEGES, 1957–1970

Subject field[1]	Actual F.T.E. staff, Fall of 1956	Total number of F.T.E. staff required for Fall of			Number of new Full-Time Equivalent staff needed during these time periods			
		1960	1965	1970	1957–60	1961–65	1966–70	1957–70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agriculture	37.0	66	91	115	40	55	63	158
Arts and Crafts	107.0	254	353	446	155	213	270	637
Biological Sciences	113.0	264	368	465	161	221	287	639
Business Administration and Education	16.1	38	52	66	23	30	36	89
Chemistry	114.5	269	374	473	164	225	260	649
Commercial Arts	333.4	784	1,090	1,377	476	656	758	1,890
Dramatic Arts	24.4	57	80	101	34	49	55	138
Economics	28.8	68	94	119	41	56	66	163
Education	3.6	8	12	15	4	8	8	20
Engineering	91.8	216	300	379	132	180	210	522
English, Speech	284.5	669	930	1,175	407	560	646	1,613
Geology	22.6	53	74	93	33	44	51	128

German	34.3	57	79	100	35	48	55	138
History	102.5	241	335	425	146	201	234	581
Home Economics	84.0	120	180	227	78	108	120	309
Industrial Arts	330.3	797	1,109	1,401	485	669	771	1,935
Journalism	30.7	72	100	127	43	60	71	174
Mathematics	143.6	337	470	593	205	283	329	814
Music	96.9	228	317	400	139	190	219	548
Philosophy	19.6	45	62	78	27	38	43	108
Physical Education and Health Education	271.6	638	888	1,122	388	535	618	1,541
Physics	70.2	165	230	290	101	138	160	398
Political Science	41.5	97	136	171	58	81	94	233
Psychology	79.0	186	258	326	113	155	180	448
Romance Languages	90.9	214	297	375	131	180	209	523
Sociology	21.0	49	69	87	28	41	47	116
All other fields	202.1	474	662	836	293	391	434	1,118
Totals	2,755.5	6,475	9,010	11,380	3,940	5,430	6,260	15,620

[1] Subject fields specified in Column (1) of this table account for 92.7 per cent of total staff of junior colleges.
[2] Actual F.T.E. staff of public junior colleges computed on the basis of 38 institutions from which data were gathered in the *Restudy*.

TABLE 5

Estimates of Full-Time-Equivalent Staff Needs by Field in California State Colleges, 1957–1970

Subject field	Actual F.T.E. staff, Fall 1957	Total number of F.T.E. staff required for Fall of			Number of new Full-Time-Equivalent staff needed during these time periods			
	1957	1960	1965	1970	1957–60	1961–65	1966–70	1957–70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agriculture	82.0	189	301	437	108	304	370	391
Arts and Crafts	68.7	157	249	363	90	167	303	400
Biological Sciences	80.7	198	315	458	114	214	302	630
Business Administration and Education	95.0	217	345	502	125	334	391	980
Chemistry	40.3	92	146	213	54	99	137	290
Commercial Arts	37.4	62	100	145	35	69	93	197
Dramatic Arts	34.7	79	126	183	45	85	117	247
Economics	350.1	584	930	1,352	335	633	803	1,831
Education	70.3	160	255	370	93	174	238	501
Engineering	166.9	380	606	881	213	413	570	1,201
English, Speech	9.5	22	34	50	13	23	33	66
Geology								

German	5.9	14	22	31	9	15	19	43
History	47.6	108	173	251	63	120	160	343
Home Economics	29.2	67	106	154	39	71	98	208
Industrial Arts	48.0	109	174	253	63	119	162	344
Journalism	18.9	43	69	100	25	47	65	137
Mathematics	51.8	118	188	273	67	128	173	368
Music	77.8	177	282	411	103	192	263	558
Philosophy	14.3	32	52	75	18	36	47	101
Physical Education and Health Education	130.0	296	472	686	170	322	438	930
Physics	39.8	91	144	210	53	98	136	287
Political Science	36.4	83	132	192	48	90	124	262
Psychology	74.9	171	272	396	97	185	254	536
Romance Languages	21.2	48	77	112	28	53	72	153
Sociology	19.3	44	70	102	25	48	66	139
All other fields	148.4	339	540	785	194	372	496	1,062
Totals	1,701.9	3,880	6,180	8,985	2,230	4,210	5,745	12,185

[1] Subject fields specified in Column (1) of this table account for 91.3 per cent of total staff of state colleges.
[2] Actual F.T.E. staff of all the state colleges, as shown in Table 56, p. 436, in the *Restudy*.

TABLE 6

ESTIMATES OF FULL-TIME-EQUIVALENT STAFF NEEDS BY FIELD IN THE UNIVERSITY OF CALIFORNIA, 1957–1970

Subject field[1]	Actual F.T.E. staff,[2] 1953	Total number of F.T.E. staff required for Fall of			Number of new Full-Time-Equivalent staff needed during these time periods			
		1960	1965	1970	1957–60	1961–65	1966–70	1957–70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agriculture	446.1	682	984	1,315	279	542	667	1,488
Arts and Crafts	109.6	168	242	323	68	134	162	364
Biological Sciences	150.1	229	331	442	94	183	224	501
Business Administration and Education	98.6	151	217	291	61	119	145	325
Chemistry	118.8	182	262	350	75	145	178	398
Commercial Arts	.....	.....	.....	.....	.....	.....	.....	.....
Dramatic Arts	40.5	62	89	119	24	49	61	134
Economics	68.0	104	150	200	43	82	101	226
Education	120.5	184	266	355	79	147	179	405
Engineering	245.1	375	540	722	153	296	366	815
English, Speech	151.0	231	333	445	94	183	225	502
Geology	42.6	65	94	126	26	52	65	143

German	41.0	63	90	121	26	49	62	137
History	82.0	125	181	242	51	100	123	274
Home Economics	53.2	81	117	157	33	65	81	179
Industrial Arts	19.4	30	43	57	11	32	20	63
Journalism	10.8	16	24	32	7	13	16	36
Mathematics	101.4	118	188	273	63	124	150	337
Music	60.0	92	132	177	38	73	90	201
Philosophy	34.4	52	76	101	21	42	52	115
Physical Education and Health Education	107.1	164	236	316	68	129	160	357
Physics	86.3	131	190	254	53	106	128	287
Political Science	69.2	106	153	204	43	84	103	230
Psychology	62.2	95	137	183	39	76	92	207
Romance Languages	121.3	185	267	357	75	147	181	403
Sociology	37.2	57	82	125	24	45	56	125
All other fields	323.2	537	751	968	212	378	503	1,093
Totals	2,799.6	4,285	6,175	8,255	1,760	3,395	4,190	9,345

[1] Subject fields specified in Column (1) of this table account for 88.4 per cent of total staff of the University of California.
[2] Actual F.T.E. staff of Berkeley, Los Angeles, Davis, Riverside, and Santa Barbara campuses, omitting military staff.

TABLE 7

ESTIMATES OF FULL-TIME-EQUIVALENT STAFF NEEDS BY FIELD IN CALIFORNIA PRIVATE COLLEGES AND UNIVERSITIES, 1957–1970

Subject field[1]	Actual F.T.E. staff,[2] 1953	Total number of F.T.E. staff required for Fall of			Number of new Full-Time-Equivalent staff needed during these time periods			
		1960	1965	1970	1957–60	1961–65	1966–70	1957–70
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Agriculture	4.0	5	6	8	2	2	5	9
Arts and Crafts	173.2	233	280	326	87	123	135	345
Biological Sciences	110.9	149	179	209	55	78	87	220
Business Administration and Education	113.8	153	184	214	56	81	88	225
Chemistry	104.0	140	168	196	51	73	81	205
Commercial Arts	30.2	41	49	57	15	21	23	59
Dramatic Arts	24.5	33	39	46	13	16	18	47
Economics	121.6	164	196	229	60	86	96	242
Education	187.2	252	302	352	92	132	146	370
Engineering	93.1	125	150	175	46	66	73	185
English, Speech	257.6	346	416	485	127	182	202	511
Geology	34.4	46	56	65	16	25	27	68

German	45.3	61	73	85	22	32	36	90
History	109.0	146	176	205	53	77	85	215
Home Economics	22.0	30	35	41	13	15	16	44
Industrial Arts	9.6	13	16	18	5	7	8	20
Journalism	12.8	17	21	24	7	9	8	24
Mathematics	78.2	105	126	147	41	54	61	156
Music	205.4	276	332	387	101	145	160	406
Philosophy	70.2	94	113	132	34	50	56	140
Physical Education and Health Education	121.0	163	195	228	59	84	95	238
Physics	69.6	93	112	130	34	49	54	137
Political Science	52.8	71	85	100	27	37	42	106
Psychology	121.8	164	197	229	60	86	96	242
Romance Languages	99.0	133	160	186	49	70	77	196
Sociology	39.0	53	63	74	20	27	31	78
All other fields	359.9	487	585	682	179	255	282	716
Totals	2,670.1	3,593	4,314	5,030	1,324	1,882	2,088	5,294

[1] Subject fields specified in Column (1) of this table account for 86.5 per cent of total staff of private colleges and universities, according to the 1953 sample of 21 institutions.

[2] Estimated F.T.E. staff of all private colleges and universities, computed on the basis of a sample of 21 institutions, which accounted for 47.7 per cent of total private college enrollment in 1953.

TABLE 8

TOTAL NUMBER OF NEW FULL-TIME-EQUIVALENT STAFF NEEDED IN CALIFORNIA BY SUBJECT FIELDS AND BY SEGMENT OF HIGHER EDUCATION FOR THE PERIOD 1957–1970

Subject field	Junior colleges		State colleges		Univ. of California		Private colleges		Totals	Per cent by field
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent		
Agriculture	158	7.0	591	26.3	1,488	66.2	9	0.4	2,246	5.3
Arts and Crafts	637	34.7	490	26.7	364	19.8	345	18.8	1,836	4.3
Biological Sciences	639	32.3	620	31.3	501	25.3	220	11.1	1,980	4.7
Bus. Ad. and Ed.	89	6.7	680	51.6	325	24.6	225	17.0	1,319	3.1
Chemistry	649	42.1	290	18.8	398	25.8	205	13.3	1,542	3.6
Commercial Arts	1,890	97.0	.....	....	.....	....	59	3.0	1,949	4.6
Dramatic Arts	138	26.7	197	38.2	134	26.0	47	9.1	516	1.2
Economics	163	18.6	247	28.1	226	25.7	242	27.6	878	2.1
Education	20	0.8	1,831	69.7	405	15.4	370	14.1	2,626	6.2
Engineering	522	25.8	501	24.8	815	40.3	185	9.1	2,023	4.8
English, Speech	1,613	42.1	1,201	31.4	502	13.1	511	13.4	3,827	9.0
Geology	128	31.6	66	16.3	143	35.3	68	16.8	405	1.0
German	138	33.8	43	10.5	137	33.6	90	22.0	408	1.0

History	581	41.1	343	24.3	274	19.4	215	15.2	1,413	3.3
Home Economics	309	41.8	208	28.1	179	24.2	44	5.9	740	1.7
Industrial Arts	1,925	81.8	344	14.6	63	2.7	20	0.8	2,352	5.5
Journalism	174	46.9	137	36.9	36	9.7	24	6.5	371	0.9
Mathematics	814	48.6	368	22.0	337	20.1	156	9.3	1,675	3.9
Music	548	32.0	558	32.6	201	11.7	406	23.7	1,713	4.0
Philosophy	108	23.3	101	21.8	115	24.8	140	30.2	464	1.1
P. E. and Health Education	1,541	50.3	930	30.3	357	11.6	238	7.8	3,066	7.2
Physics	398	35.9	287	25.9	287	25.9	137	12.4	1,109	2.6
Political Science	233	28.0	262	31.5	230	27.7	106	12.8	831	2.0
Psychology	448	31.3	536	37.4	207	14.4	242	16.9	1,433	3.4
Romance Languages	523	41.0	153	12.0	403	31.6	196	15.4	1,275	3.0
Sociology	116	25.3	139	30.3	125	27.3	78	17.0	458	1.1
All other fields	1,118	28.0	1,062	26.6	1,093	27.4	716	17.9	3,989	9.4
Totals	15,620		12,185		9,345		5,294		42,444	
Per cent		36.8		28.7		22.0		12.5		100

Note: Per cents by segment add across. For total per cents by field add down. Sum of per cents may not equal 100 due to independent rounding.

staff required in 1970 in these four segments, it will be necessary to recruit between 1957–1970 a total of 42,444 new full-time-equivalent staff members or more than four times the total 1953 staff.

That the above staff need estimates are reasonable in terms of enrollment estimates in each segment is supported by the data in Table 10 which show the

TABLE 9

SUMMARY OF ESTIMATES OF TOTAL F.T.E. STAFF REQUIRED AND NEW F.T.E. STAFF NEEDED IN CALIFORNIA JUNIOR COLLEGES, STATE COLLEGES, UNIVERSITY OF CALIFORNIA AND PRIVATE COLLEGES AND UNIVERSITIES, 1957–1970

Year or period	Junior colleges	State colleges	University of California	Private institutions	Totals
A. Total Full-Time-Equivalent Staff Required					
Year					
1953 (actual)[1]	2,755	1,702	2,800	2,670	9,927
1956 (actual)	3,969[2]	2,533[2]	3,292	3,046[3]	12,840
1960	6,475	3,880	4,285	3,593	18,233
1965	9,010	6,180	6,175	4,314	25,679
1970	11,380	8,985	8,255	5,030	33,350
Per cent 1970 is of 1953	413	528	295	188	339
B. New Full-Time-Equivalent Staff Needed to Maintain Above Requirements					
Period					
1957–60	3,940	2,230	1,760	1,324	9,254
1961–65	5,420	4,210	3,395	1,882	14,907
1966–70	6,260	5,745	4,190	2,088	18,283
Total 1957–70	15,620	12,185	9,345	5,294	42,444

[1] Source: *Restudy* I.B.M. tabulations for 1953.
[2] Full-time staff (i.e., not F.T.E. staff).
[3] Estimated from 1953 data.

actual student-teacher ratios for 1953 and 1956 and the projected student-teacher ratios based on the estimates of enrollment and staff needs for 1960, 1965, and 1970. The projected ratios, it will be noted, are consistent with the existing ratios of 1953 and 1956. The total full-time-equivalent staff figures used for 1960, 1965, and 1970 in Table 10 have been taken from Table 9, Part A.

The method used by the Joint Staff in determining the total demand for full-time-equivalent faculty by segment of higher education and by year, was to expand the 1953 staff in each department by segment of education to accommodate increased growth. Table 10 provides a check on the method employed by the Joint Staff and indicates that the departmental approach as summarized by segment of education provides consistent over-all student-faculty ratios.

TABLE 10

COMPARISON OF ACTUAL AND PROJECTED STUDENT-FACULTY RATIOS BY SEGMENT OF HIGHER EDUCATION IN CALIFORNIA TO 1970

Year	Ratio of full-time enrollment to F.T.E. faculty	Segment of higher education				
		Junior colleges	State colleges	University of California	Private institutions	Totals
1953 (Actual)	F.T.E faculty	2,755	1,702	2,800	2,670	9,927
	Full-time enrollment	52,142	24,712	32,700	37,167	146,721
	Enrollment per F.T.E. faculty	18.9	14.5	11.7	13.9	14.8
1956 (Actual)	F.T.E. faculty	3,969[1]	2,533[1]	3,292	3,046[2]	12,840
	Full-time enrollment	74,082	38,338	37,522	42,396	192,338
	Enrollment per F.T.E. faculty	18.7	15.1	11.4	13.9	15.0
1960 (Projected)	F.T.E. faculty	6,475	3,880	4,285	3,593	18,233
	Full-time enrollment	118,800	56,400	50,000	50,000	275,200
	Enrollment per F.T.E. faculty	18.3	14.5	11.7	13.9	15.1
1965 (Projected)	F.T.E. faculty	9,010	6,180	6,175	4,314	25,679
	Full-time enrollment	165,400	89,700	72,100	60,000	387,200
	Enrollment per F.T.E. faculty	18.3	14.5	11.7	13.9	15.1
1970 (Projected)	F.T.E. faculty	11,380	8,985	8,255	5,030	33,650
	Full-time enrollment	209,200	130,400	96,400	70,000	506,000
	Enrollment per F.T.E. faculty	18.4	14.5	11.7	13.9	15.0

Source: F.T.E. faculty from Part A, Table 9. Full-time enrollment from Table 3.

[1] Full-time staff rather than F.T.E. staff.

[2] Estimated on basis of 1953 F.T.E. staff of 2,670 increased in same proportion as enrollment to 114 per cent of 1953 staff.

Chapter IV

CERTAIN CHARACTERISTICS OF FACULTY APPOINTEES IN HIGHER EDUCATION IN CALIFORNIA

In the preceding pages an effort has been made to answer the first of the questions at the beginning of Chapter II. This chapter will provide information on the second question, which is:

"What are the characteristics of faculty at the time of first appointment with respect to highest degree held, source of recruitment, rank to which first appointed and institution from which doctorate was received?"

Certain Characteristics of New Academic Appointees to the University of California for the Years 1954, 1955, and 1956

Whether the place of residence of the 1954–1956 academic appointees to the University of California was in-state or out-of-state at the time of appointment during the three-year period 1954–1956 is shown in Table 11. It will be noted from the footnote to the table that only those appointed to the regular faculty at the ranks of professor, associate professor, assistant professor, and instructor, who were engaged to teach 51 per cent or more of full time, are included. Visiting, acting, and temporary appointments have not been included in either the University or state college figures because of the fluctuations in their numbers and length of service.

TABLE 11

GEOGRAPHICAL SOURCE OF FULL-TIME UNIVERSITY OF CALIFORNIA FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Source of faculty	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
In-state	44	40.7	51	39.5	48	27.4	143	34.7
Out-of-state	64	59.3	78	60.5	127	72.6	269	65.3
Totals	108	100.0	129	100.0	175	100.0	412	100.0

Source: Bio-Bibliographical Service, Administration Building, Berkeley Campus.
Note: Above figures include all individuals appointed for the academic years 1954–55, 1955–56, and 1956–57, who were engaged as regular faculty to teach 51 per cent or more of full time, with the rank of professor, associate professor, assistant professor, or instructor. Not included are the visiting, acting, and temporary appointees and those who teach less than 51 per cent of full time.

Because it is important to know not only the place of residence of the appointees in higher education in California but also the highest degree held by those persons at the time of appointment, that information for the appointees included in Table 11 is given in Table 12. No significant trends are indicated

here. It will be seen that the percentage of the new appointees with a doctor's degree changed little during the three-year period. If the percentage of doctorates is one measure of quality of instruction, as it probably is, then recruitment problems have not so far significantly changed this measure.

TABLE 12

HIGHEST DEGREE HELD BY FULL-TIME UNIVERSITY OF CALIFORNIA FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Highest degree held at appointment	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Doctor's[1]	87	80.6	105	81.4	137	78.3	329	79.8
Master's	16	14.8	20	15.5	32	18.3	68	16.5
Bachelor's	4	3.7	3	2.3	6	3.4	13	3.2
None	1	.9	1	.8	0	.0	2	.5
Totals	108	100.0	129	100.0	175	100.0	412	100.0

Source: Bio-Bibliographical Service, Administration Building, Berkeley Campus.
Note: Degrees held by *total* full-time faculty, September 1956: Doctor's, 83.3 per cent; Master's, 13.4 per cent; Bachelor's, 2.6 per cent; None, 0.7 per cent.
[1] Includes 33 M.D. degree-holders in Los Angeles, 2 in Berkeley, and 16 in San Francisco. If these are deducted then the total percentage drops from 79.8 to 67.4.

TABLE 13

OCCUPATIONAL SOURCE OF FULL-TIME APPOINTEES TO UNIVERSITY OF CALIFORNIA FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Occupation prior to appointment	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Teaching	42	38.9	44	34.1	62	35.4	148	35.9
Graduate School	35	32.4	49	38.0	64	36.6	148	35.9
Research	11	10.2	14	10.8	22	12.6	47	11.4
Industry	14	13.0	14	10.8	19	10.8	47	11.4
Government	4	3.7	2	1.6	5	2.9	11	2.7
Miscellaneous	2	1.8	6	4.7	3	1.7	11	2.7
Totals	108	100.0	129	100.0	175	100.0	412	100.0

Source: Bio-Bibliographical Service, Administration Building, Berkeley Campus.

The type of employment immediately prior to faculty appointment for the 412 University of California faculty appointees (1954–1956) is shown in Table 13. As would be expected the teaching field, graduate school, and research are the main sources of supply. These account for 83.2 per cent of the appointees. In view of the competitive salaries in industry, it is interesting that in total over 11

per cent came from that source. There seems no significant trend during the years covered by the table.

Another possible qualitative indicator may be found in the list of institutions which conferred the doctorates held by appointees to the full-time academic faculty of the University of California. The institutions which conferred five or more doctorates held by appointees for the years 1954–1956 are named in Table 14. The seventeen institutions listed there awarded 82 per cent of the total number of doctorates, exclusive of the M.D. degree, for the three-year period: the ten

TABLE 14

INSTITUTIONS WHICH CONFERRED FIVE OR MORE OF THE DOCTORATES HELD BY APPOINTEES TO THE FULL-TIME ACADEMIC FACULTY OF THE UNIVERSITY OF CALIFORNIA FOR THE YEARS 1954–1956

Institutions	Doctorates received[1]	Institutions	Doctorates received[1]
California (Statewide)	58	Minnesota	8
Chicago	10	Northwestern	5
Columbia	10	Pennsylvania	5
Cornell	6	Princeton	10
Harvard	26	Southern California	5
Illinois	11	Stanford	13
Iowa	6	Wisconsin	15
Iowa State	6	Yale	18
Michigan	14	Sub-total	226
		Other institutions	52
		Total Doctorates[1]	278

Source: Bio-Bibliographical Service, Administration Building, Berkeley Campus.
[1] Excludes 51 M.D. degrees held by the new appointees.

private institutions awarded 47.8 per cent of these doctorates and the seven public ones the remaining 52.2 per cent. Many of the outstanding universities in the United States are represented in this list. Likewise, those institutions granting doctorates to fewer than five appointees also include a number of outstanding institutions.

One of the possible effects of a short supply of potential faculty, besides the appointment of a lower percentage of doctors, might be the appointment of increasingly larger percentages of new staff members at the ranks above instructor or assistant professor. Table 15 shows that for the years 1954–1956 this was not true for the University of California. As a matter of fact the percentage of appointments at the instructor level increased from 14.8 in 1954 to 54.3 in 1956. Attention is also called to the fact that the appointments at the two lowest ranks—assistant professor and instructor—accounted for 87.4 per cent of the total.

Certain Characteristics of New Academic Appointees to the State Colleges, 1954, 1955, and 1956

Tables 16 through 20 give data on faculty appointees for the state college system similar to those which have been presented for the University of California. The figures include all individuals appointed for the academic years 1954–55, 1955-56, and first semester 1956–57, who were engaged as regular faculty to teach full time with the rank of professor, associate professor, assistant professor, instructor, or equivalents. Not included are part-time and temporary appointees. The most striking comparison between the University and the state colleges is

TABLE 15

RANK OF APPOINTMENT OF FULL-TIME UNIVERSITY OF CALIFORNIA FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Rank at appointment	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Professor.....	4	3.7	11	8.5	12	6.9	27	6.6
Associate Professor.....	8	7.4	6	4.7	11	6.2	25	6.1
Assistant Professor.....	80	74.1	59	45.7	57	32.6	196	47.6
Instructor.....	16	14.8	53	41.1	95	54.3	164	39.8
Totals.....	108	100.0	129	100.0	175	100.0	412	100.0

Source: Bio-Bibliographical Service, Administration Building, Berkeley Campus.

that of the number of new appointments. From the Fall of 1954 to the Fall of 1956, the University appointed 412 full-time faculty members and the state colleges 1,188 full-time faculty members. However, this was a period of unusually active curriculum and enrollment expansion in the state colleges, but not in the University, so the less striking relationship of faculty numbers indicated in Table 8 is probably nearer the future reality.

Table 16 indicates the residence of state college faculty members at the time of initial appointment in the three-year period. For the state college system as a whole more than one-half of the faculty members came from out of state, but the percentages for the state colleges were not as high as for the University. In a breakdown by years the system percentages for out-of-state faculty appointments were 50.6 in 1954, 55.3 in 1955, and 55.3 in 1956. When all three years are combined the percentage is 54.4. It will be recalled that this percentage is somewhat below that of the University, although during the three-year period it did increase from 50.6 to 55.3.

Table 17 shows the highest degree held by appointees at the time of appointment. For the system as a whole 42.9 per cent of the appointees held the doctorate

and 47.0 per cent held the master's degree. The footnote of the table also shows the degrees held by the *total* full-time faculty in 1956. The percentage of doctorates was 53.5. From this difference in percentages of those with the doctorate at the time of appointment and of the total staff, it can be inferred that considerable encouragement is given by the state colleges for those appointed with less

TABLE 16

GEOGRAPHICAL SOURCE OF FULL-TIME CALIFORNIA STATE COLLEGE FACULTY MEMBERS AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Source of faculty	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
In-state	116	49.4	186	44.7	239	44.5	541	45.5
Out-of-state	119	50.6	230	55.3	297	55.3	646	54.4
					1[1]	0.2	1[1]	0.1
Totals	235	100.0	416	100.0	537	100.0	1,188	100.0

Source: State Department of Education, Personnel Office records.
[1] Unknown.

TABLE 17

HIGHEST DEGREES HELD BY FULL-TIME CALIFORNIA STATE COLLEGE FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Highest degree held at appointment	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Doctor's	97	41.3	191	45.9	222	41.3	510	42.9
Master's	112	47.6	184	44.2	263	49.0	559	47.0
Bachelor's	25	10.6	39	9.4	51	9.5	115	9.7
None	1	0.4	2	0.5	1	0.2	4	0.3
Totals	235	100.0	416	100.0	537	100.0	1,188	100.0

Source: State Department of Education, Personnel Office records.
Note: Degrees held by *total* full-time faculty, 1956, are: Doctor's, 53.5 per cent; Master's, 38.2 per cent; Bachelor's, 7.4 per cent; None, 0.9 per cent.

than the doctor's degree to complete degree requirements. As in the case of the University no significant trend in the percentage of doctorates between 1954 and 1956 is apparent, and the same inference can be drawn that the quality of instruction probably has not significantly changed with the new appointments.

The source of full-time, state college faculty at the time of appointment is shown in Table 18. By far the greatest number comes from teaching (71.4 per cent of the total). Next to other teaching assignments, the graduate school is the most fruitful source of faculty. This, however, accounts for only 9 per cent of the total, and some of these undoubtedly have been teachers who have returned

to graduate school for advanced degrees. When the data in Table 18 are compared with those in Table 13, it is immediately evident that the University depends much more heavily upon the graduate school for the source of its initial appointments than do the state colleges. It is interesting that industry and research also contribute almost twice as large a percentage of appointees to the University as to the state colleges. If only numbers are considered, the University is obtaining a slightly larger number of appointees from graduate schools and from industry than do the state colleges, but the University obtained 21 fewer appointees from research positions than did the state colleges.

TABLE 18

OCCUPATIONAL SOURCE OF FULL-TIME CALIFORNIA STATE COLLEGE FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Prior occupational source	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Teaching[1]	150	63.8	304	73.1	394	73.4	848	71.4
Graduate School	26	11.1	42	10.1	39	7.3	107	9.0
Research	16	6.8	23	5.5	29	5.4	68	5.7
Government	11	4.7	12	2.9	29	5.4	52	4.4
Industry	15	6.4	15	3.6	14	2.6	44	3.7
Miscellaneous	17	7.2	20	4.8	32	6.0	69	5.8
Totals	235	100.0	416	100.0	537	100.0	1,188	100.0

Source: State Department of Education, Personnel Office records.
[1] Teaching as used here includes persons engaged in either classroom teaching or administration or both in any segment of education.

During the three-year period covered by this study, the University appointed 226 doctors from the 17 institutions contributing five or more of the appointees to the full-time academic faculty of the University of California (see Table 14). From Table 19 it will be seen that during the same period state college appointments from the 26 institutions which contributed five or more doctors to the full-time state college faculties numbered 427. Thirteen of the 17 institutions conferring five or more of the doctorates held by appointees to the University of California also contributed five or more doctorates held by appointees to the state college faculties. The balance of the institutions contributing five or more doctors to the state college faculties are well known and recognized institutions. It seems reasonable to conclude that the sources for faculties of the University and state college system are comparable at the doctoral level.

In the matter of the ranks to which initial appointments are made, the state colleges (Table 20) appointed a smaller percentage to the levels of professor, associate professor and instructor, and a higher percentage to the level of assistant professor than did the University, i.e., 68.1 per cent and 47.6 per cent, respectively, were appointed at the rank of assistant professor. However, it will be noted that

TABLE 19

INSTITUTIONS WHICH CONFERRED FIVE OR MORE OF THE DOCTORATES HELD BY APPOINTEES TO THE FULL-TIME STATE COLLEGE FACULTIES, 1954–1956 INCLUSIVE

Institutions	Doctorates received	Institutions	Doctorates received
California (Statewide)	65	Minnesota	25
Chicago	18	Missouri	8
Claremont	5	Nebraska	5
Colorado	6	New York	8
Columbia	23	Northwestern	9
Cornell	8	Ohio State	13
Denver	12	Oklahoma	5
Illinois	12	Oregon	11
Indiana	12	Oregon State	6
Iowa	24	Stanford	44
Iowa State	11	Southern California	31
Kansas	9	Washington	24
Michigan	13	Wisconsin	20
		Sub-total	427
		Other institutions	83
		Total Doctorates	510

Source: State Department of Education, Personnel Office records.

TABLE 20

RANK OF APPOINTMENT OF FULL-TIME CALIFORNIA STATE COLLEGE FACULTY AT TIME OF APPOINTMENT, BY YEAR, 1954–1956

Rank at appointment	1954		1955		1956		Total	
	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent
Professor	2	0.8	5	1.2	16	3.0	23	1.9
Associate Professor	6	2.6	21	5.0	17	3.2	44	3.7
Assistant Professor	135	57.4	283	68.0	391	72.8	809	68.1
Instructor	92	39.1	107	25.7	113	21.0	312	26.3
Totals	235	100.0	416	100.0	537	100.0	1,188	100.0

Source: State Department of Education, Personnel Office records.

the percentage of state college appointments at the rank of assistant professor increased from 57.4 per cent in 1954 to 72.8 per cent in 1956. This substantial increase supports the belief that short supply and heavy demand have forced increased appointments at the level of assistant professor instead of at the level of instructor.

Certain Characteristics of New Academic Appointees to the Public Junior Colleges, 1957–1958

A special study of certain characteristics of new junior college teachers for the one year, 1957–58, has recently been made by Oscar Edinger, President of Mt. San Antonio Junior College, in cooperation with the California Junior College Association. Data from that study comparable to the data presented above for the University of California and for the state colleges is presented in Table 21.

Part A, Table 21, indicates that 15.8 per cent of new junior college staff came from out of state. This per cent applies directly to the 457 who held a teaching position the prior year and may be assumed to apply also to the total of 589 new appointees. Thus, a considerably larger proportion of new appointees to the junior colleges are residents of California than is the case at either the University or the state colleges (see Tables 11 and 16).

Part B, Table 21, indicates that 65.0 per cent of new junior college staff are appointed at the master's degree level and 6.3 per cent at the doctor's degree level. The note to this part of the table shows the distribution of degrees held by the entire body of full-time junior college faculty in the fall of 1956, with doctor's degrees constituting 10.0 per cent and master's degrees, 62.8 per cent of the total.

Finally, Part C of Table 21 indicates the prior occupational source of the 589 new junior college faculty. Almost 78 per cent came from educational positions and only 22 per cent from non-educational sources. Of the 457 new staff who came from prior teaching positions, 271 came from high schools.

Degrees Held by Private College and University Faculty

Although a tabulation of the highest degrees held by staff members at the time of appointment in the private colleges and universities is not available, a check has been made of the highest degrees held by the regular teaching staff (exclusive of visiting staff lecturers, research associates and emeritus professors) in 23 of the 26 departments used in this study for the year 1956–57 at the University of Southern California. Of the 312 persons with the rank of professor, associate professor, assistant professor and instructor, 224, or 72 per cent, held a doctorate and 60, or 19 per cent, held the master's degree.[1] It seems a reasonable assumption that the distribution of the highest degrees held by new appointees at this institution as well as the other major private ones, will approximate those found at the University of California and the state colleges.

[1] Bulletin of the University of Southern California, Vol. 52, Number 7, November 15, 1956.

TABLE 21

Certain Characteristics of New Academic Appointees to the Public Junior Colleges in California, 1957–58

Part A

Geographic source of faculty	Number	Per cent	Number	Per cent
New to teaching this year (geographic source unknown)			132	22.4
In teaching position prior year			457	77.6
In-state	385	84.2		
Out-of-state	72	15.8		
Totals	457	100.0	589	100.0

Part B

Highest degree held at appointment	Number	Per cent
Doctor's	37	6.3
Master's	383	65.0
Bachelor's or none	169	28.7
Totals	589	100.0

Note: Degrees held by total full-time California public junior college teachers, Fall, 1956, are: Doctor's, 10.0 per cent; Master's, 62.3 per cent; Bachelor's, 19.4 per cent; None, 7.8 per cent.

Part C

Occupation prior to appointment	Number	Per cent
Teaching, College	77	13.1
Teaching, Junior College	89	15.1
Teaching, High School	271	46.0
Teaching, Elementary	20	3.4
Non-Teaching (Graduate school, industry, etc.)	132	22.4
Totals	589	100.0

Source: Replies from 56 public California junior colleges to a questionnaire from Oscar Edinger, President of Mt. San Antonio Junior College, in cooperation with the Executive Committee of the California Junior College Association.

Chapter V

ESTIMATES OF PROBABLE IN- AND OUT-OF-STATE SUPPLY OF COLLEGE FACULTY FROM HOLDERS OF DOCTOR'S AND MASTER'S DEGREES

At first thought, it appears that the sources for replenishing the pool from which college faculty are drawn consist of two categories; namely, those trained within the State, and those trained without. This approach further suggests that a fairly satisfactory answer to the question of where the additional staff needed in California will be found, could be had by finding the current output of graduates with master's and doctor's degrees from institutions within the State, estimating the output of such degree holders by these institutions in years up to 1970, and adding the expected number of such persons from out of state.

Nature of the Problem

However, a more careful examination of the problem shows that it does not lend itself to such a simple solution as suggested above, chiefly for these reasons:

1. Although the total number of individuals who received master's and doctor's degrees conferred annually by California institutions of higher education is available, how the degrees are distributed among subject fields is known only in part.

2. Even though this distribution were completely known, there are these further questions: What percentage of these degree holders will teach? if they do teach, how many will teach in California? if in California, in what segment of the State's system of higher education will they teach? This problem involves estimating the true supply available to meet the demands of each segment for faculty in each field.

3. An analysis of the immediately prior occupations of appointees shows that 35.9 per cent of the University's faculty and 71.4 per cent of the state college faculty came from teaching, while 35.9 per cent and and 9.0 per cent respectively came directly from the graduate schools. It must be presumed, however, that the total potential supply from which college teachers are drawn, whether directly from graduate school, from teaching, or from other sources, is influenced by the number of master's and doctor's degrees awarded. The extent of the lag between national and state input into the pools of faculty potential and withdrawal from these pools by college and university appointments further complicates the problem of estimating the true supply. In this connection, it should be noted that major sources of earned doctorates from which California appointments are presumably made, produced 56,733 holders of doctoral degrees in the nine-year period, 1948–56, as shown by Table 22.

4. Whether the present levels of preparation for filling these staff positions are likely to change is an open question. For example, are the junior colleges, where the doctorate is not now required, likely to appoint more staff members with doctorates in the future?

TABLE 22

Probable Major Sources of Earned Doctorates for California Appointments

(Institutions in the U.S. that have conferred more than 300 earned doctorates in the nine-year period, 1948–1956, together with other institutions in western states that conferred earned doctorates in this same period.)

West		Central		East	
Institutions	Doctorates 1948–1956	Institutions	Doctorates 1948–1956	Institutions	Doctorates 1948–1956
1 Cal. Institute of Technology	625	1 Chicago	2,333	1 Boston	542
2 California	3,401	2 Illinois	2,320	2 Brown	326
3 Colorado	454	3 Indiana	1,240	3 Carnegie	325
4 Oregon State	312	4 Iowa	1,356	4 Catholic	717
5 Stanford	1,485	5 Iowa State	954	5 Columbia	4,460
6 Washington	574	6 Michigan	2,005	6 Cornell	2,169
7 Southern California	951	7 Michigan State	741	7 Duke	525
Nine-year total	7,802	8 Minnesota	1,705	8 Fordham	418
Average per year	867	9 Missouri	587	9 Harvard	2,802
Others in west conferring doctorates	1948–1956	10 Northwestern	1,130	10 Hopkins	720
1 Arizona	13	11 Nebraska	362	11 Maryland	496
2 Arizona State	4	12 Ohio State	2,091	12 Mass. Inst. of Technology	1,416
3 Claremont	33	13 Purdue	1,289	13 New York University	1,961
4 College of Pacific	5	14 Texas	1,081	14 No. Carolina	671
5 Colorado State	119	15 Washington (Mo.)	422	15 Pennsylvania	1,119
6 Colorado School of Mines	43	16 Western Reserve	339	16 Penn. State	973
7 Denver	253	17 Wisconsin	2,881	17 Pittsburgh	825
8 Montana State	2	Nine-year total	22,836	18 Princeton	815
9 New Mexico	67	Average per year	2,537	19 Rochester	444
10 N.M. Inst. Mining & Tech.	1			20 Rutgers	475
11 Oregon	184			21 Syracuse	572
12 Portland	6			22 Virginia	330
13 Utah	266			23 Yale	1,688
14 Utah State	17			Nine-year total	24,789
15 Washington State	216			Average per year	2,754
16 Wyoming	77				
Nine-year total	1,306				
Average per year	145				

Total doctorates conferred in nine years by all 63 institutions	56,733
Average per year for all 63 institutions	6,304

Source of data: *American Universities and Colleges, 1960*, American Council on Education; *Earned Degrees Conferred by Higher Educational Institutions, 1955–56*, U. S. Office of Education, Circular No. 499.

5. There is no certainty that California will be able to continue recruiting as large a proportion of its future college and university faculty needs from out-of-state sources. The reasons are: (1) California will have not only a rapid rate of enrollment increase, but also will have the largest college enrollments in the United States, which means that large numbers of new faculty will be needed; and (2) other states, facing large enrollment increases, also will be bidding for large numbers of new staff.

National Sources of Supply

The total input into the national faculty pool-potential of doctor's and master's degrees by subject field for the years 1951 to 1955 can be seen in Table 23. Because these figures represent the total number of degrees awarded, they represent the potential or gross supply rather than the true supply available to higher education. Insofar as possible the subject-field categories have been made to conform to those in Tables 4, 5, 6, 7, and 8. These specified fields include from 87.9 to 90.6 per cent of the total doctorates and from 84.5 to 90.1 per cent of the master's degrees awarded in the United States during the period covered by the table.

Suggested use of data on individual subject fields will be made later. It will be noted that there was an increase in total doctorates conferred in the United States from 7,683 in 1951 to 8,903 in 1955, or 15 per cent. There was a small increase each year except for 1954. The total number of master's degrees decreased from 63,471 to 56,823 between 1951–52 and 1953–54. The number rose again to 58,204 in 1954–55 and 59,440 in 1955–56. This was a decrease over the five-year span of 6.4 per cent. During the same period, total United States resident college and university enrollments (Table 2) increased from approximately 2,102,000 to 2,695,000, or 28 per cent.

The number and per cent of U. S. totals for doctoral degrees (exclusive of M.D. and D.V.M. degrees) and master's degrees produced in California are noted at the bottom of Table 23. While the number of California doctorates increased slightly, but not consistently, the percentage of U. S. doctorates granted in California decreased somewhat, again not consistently. On the other hand, the number of master's degrees increased slightly in California and the percentage of U. S. masters produced in California also increased from 6.1 per cent to 7.2 per cent. California's college and university enrollments for 1951–1955 increased from 144,163 to 181,113, or 25.6 per cent. Doctor's degrees conferred in California increased 8.9 per cent in the five-year period; master's degrees, 10.7 per cent.

For the five-year period covered in Table 23, the national production of graduate degrees both by field and in total was fairly stable. California's total production of graduates was also stable, but at slight variance with the national pattern. In order to have adequate college staffs in higher education in the years immediately ahead, there is little doubt that the production of graduate degree holders, especially of doctors, must increase sharply both in the nation and in California.

TABLE 23

NUMBER OF DOCTOR'S AND MASTER'S DEGREES EARNED IN THE UNITED STATES BY FIELD OF STUDY, 1951-52 TO 1955-56

Subject field	1951-52		1952-53		1953-54		1954-55		1955-56	
	Doctor's	Master's	Doctor's	Master's	Doctor's	Master's	Doctor's	Master's	Doctor's	Master's
Agriculture	475	1,732	546	1,594	578	1,401	579	1,508	605	1,413
Arts and Crafts	24	974	25	805	29	719	31	731	29	782
Biological Sciences	611	1,997	771	1,620	904	1,387	834	1,376	709	1,363
Bus. Ad. & Ed., & Commerce	92	3,826	109	4,035	118	3,114	144	3,336	151	3,620
Chemistry	1,031	1,409	999	1,211	1,013	1,098	1,005	1,173	986	1,164
Economics	239	695	222	582	245	609	241	617	232	581
Education	1,061	24,538	1,219	25,003	1,388	26,075	1,356	25,844	1,393	27,458
Engineering	529	4,091	518	3,566	594	4,204	599	4,484	610	4,724
English, Speech, & Dram Arts	402	2,807	449	2,639	503	2,405	498	2,445	509	2,594
Geology	116	486	133	517	136	412	154	507	151	531
German	56	121	37	82	46	86	26	100	33	78
History	317	1,445	301	1,294	355	1,220	310	1,199	259	1,114
Home Economics	23	649	47	608	25	590	61	705	33	451
Industrial Arts	10	420	22	488	14	444	14	544	27	627
Journalism	4	322	3	278	6	242	16	286	6	182

Mathematics	206	802	241	677	227	706	250	761	235	898
Music	55	1,738	61	1,694	73	1,577	68	1,677	81	1,075
Philosophy	102	287	107	327	103	251	84	231	82	267
P.E. & Health Education	75	1,424	116	1,336	96	1,266	100	1,232	133	1,539
Physics	485	886	478	721	485	714	511	729	470	742
Political Science	147	525	164	509	153	534	181	498	203	509
Psychology	540	1,406	583	1,161	619	1,254	688	1,293	634	973
Romance Languages	93	557	81	483	96	431	91	470	85	444
Sociology	141	517	157	504	184	440	167	474	170	402
Sub-total	6,834	53,654	7,389	51,734	7,990	51,179	8,008	52,220	7,826	53,531
All other fields	849	9,817	920	9,289	1,006	5,644	832	5,984	1,077	5,909
Totals	7,683	63,471	8,309	61,023	8,996	56,823	8,840	58,204	8,903	59,440
Selected fields as per cent of total	88.9	84.5	88.9	84.8	88.8	90.1	90.6	89.7	87.9	90.0
California degrees: number	793	3,855	794	3,900	898	3,504	856	4,090	864	4,269
Per cent of U.S. totals	10.3	6.1	9.6	6.4	10.0	6.2	9.7	7.0	9.7	7.2

Source: *Earned Degrees Conferred by Higher Educational Institutions*, U. S. Office of Education, Circulars No. 360, 380, 418, 461, and 499 (1951–52 to 1955–56).

California's Output of Advanced Degrees

Although as shown in Tables 11 and 16, 65.3 per cent of the academic appointees of the University of California for the three-year period 1954–1956, and 54.4 per cent of those similarly appointed in the state colleges, came from outside the State, the output of college and university graduates with advanced degrees from California institutions is highly important in meeting the faculty needs of the State's institutions of higher education. Moreover, it is obvious from the totals in Table 8 that these institutions must provide a greatly increased number of the State's future needs if the estimated staff requirements are to be met. What, then, is the current California output?

Table 24 shows how California compares for 1954–55 and 1955–56 with the rest of the nation in production of doctor's and master's degrees in twenty-four selected subject fields (roughly paralleling the fields specified in the tables in Chapter III). The note at the bottom of the table points out that as of July 1, 1955, California had 7.9 per cent of the nation's population, 8.1 per cent on July 1, 1956, and 8.3 per cent on July 1, 1957. From the totals it appears that California is at present producing a little more than its share of doctors and a little less than its share of masters when compared to California's percentage of the nation's population. Although California's population continues to increase in relation to the national total, the percentage of California doctorates from 1954 to 1955 did not increase, while the percentage of master's degrees increased only slightly.

It will be noted from Table 24 that there is a wide difference in the percentages by which degrees in the several fields vary from each other and from California's percentage of the national population. For example, in 1955–56 California produced no doctors in industrial arts, journalism, or physical education and health, but did produce 24 per cent of the doctors in German. For that year, the masters range from 1.5 per cent in philosophy to 22.1 per cent in arts and crafts. Again, it should be emphasized that only some of these degree holders will enter higher education and of this latter group only some will do so in California. How large these groups will be is estimated and presented in later tables (see Tables 29 and 32).

Table 25 shows the number and percentage of the California total of doctor's and master's degree holders which the University of California, the private colleges and universities, and the state colleges produced each year from 1951–52 through 1955–56. As noted in the table the state colleges are not authorized to grant doctor's degrees, but their production of masters rose from 10.7 per cent of the California total in 1951–52 to 28.2 per cent in 1955–56. This accounts for a decline in the percentages produced both by the University of California and the private colleges and universities.

The University of California (largely the Berkeley and Los Angeles campuses) produced over half of the doctor's degree holders from California institutions. During the period covered by the table, private institutions gained a little—from 45.6 per cent to 47.7 per cent. Likewise, it will be noted that the total

TABLE 24

NUMBER OF DOCTOR'S AND MASTER'S DEGREES AWARDED IN CALIFORNIA BY FIELD OF STUDY AND AS PER CENT OF TOTAL DOCTOR'S AND MASTER'S DEGREES AWARDED IN EACH FIELD IN THE UNITED STATES, 1954–55 AND 1955–56

Subject Field	1954–55				1955–56			
	Doctor's		Master's		Doctor's		Master's	
	Number	Per cent[1]	Number	Per cent[1]	Number	Per cent[1]	Number	Per cent[1]
Agriculture	18	3.1	34	2.2	37	6.1	66	4.7
Arts and Crafts	0	0.0	133	18.2	2	6.9	173	22.1
Biological Sciences	103	12.4	110	8.0	94	13.2	112	8.2
Bus. Ad., Bus. Ed., and Commerce	3	2.1	146	4.4	2	1.3	193	5.3
Chemistry	83	8.2	33	2.8	77	7.8	33	2.8
Economics	39	16.2	45	7.3	37	15.9	43	7.4
Education	145	10.7	1,771	6.8	173	12.4	1,881	6.8
Engineering	69	11.5	487	10.9	61	10.0	517	10.9
English, Speech, and Dramatic Arts	40	8.0	194	7.9	36	7.1	174	6.7
Geology	16	10.4	50	9.9	32	21.2	56	10.5
German	5	19.2	13	13.0	8	24.2	9	11.5
History	29	9.4	86	7.2	29	11.2	67	6.0
Home Economics	6	9.8	19	2.7	2	6.1	11	2.4
Industrial Arts	0	0.0	18	3.3	0	0.0	43	6.8
Journalism	1	6.2	42	14.7	0	0.0	28	15.4
Mathematics	40	16.0	49	6.4	28	11.9	33	3.7
Music	4	5.9	93	5.5	10	12.3	96	8.9
Philosophy	4	4.8	8	3.5	9	11.0	4	1.5
P.E. & Health Ed.	3	3.0	65	5.3	0	0.0	97	6.3
Physics	79	15.4	66	9.0	75	16.0	63	8.5
Political Science	17	9.4	48	9.6	23	11.3	41	8.0
Psychology	69	10.0	85	6.6	39	6.2	100	10.3
Romance Languages	13	14.3	33	7.0	13	15.3	36	8.1
Sociology	8	4.8	43	9.1	9	5.3	25	6.2
Sub-total	794		3,671		796		3,901	
All other fields	62		419		68		368	
Totals	856	9.7	4,090	7.0	864	9.7	4,269	7.2

Source: U. S. Office of Education, *Earned Degrees Conferred by Higher Educational Institutions*, Circulars 461 and 499 (1954–55, 1955–56).

Note: California's estimated total population of 13,035,000 on July 1, 1955 was 7.9 per cent of the estimated total United States population of 164,303,000 on the same date. On July 1, 1956 California's estimated total population was 8.1 per cent of the United States total. See *California's Population in 1957*, Department of Finance, July, 1957, p. 10. (On July 1, 1957, this per cent was 8.3.)

[1] These are the percentages which the degrees awarded by California institutions are of the total awarded in the United States.

TABLE 25

NUMBER AND PER CENT OF DOCTOR'S AND MASTER'S DEGREES AWARDED IN CALIFORNIA BY SEGMENT OF HIGHER EDUCATION, BY YEAR, 1951–52 TO 1955–56

Year	Doctor's Degrees[1]					Master's degrees						
	University of California		Private institutions		Total doctor's	State colleges	University of California		Private institutions		Total master's
	Number	Per cent	Number	Per cent	Number	Number	Per cent	Number	Per cent	Number	Per cent	Number
1951–52	431	54.4	362	45.6	793	411	10.7	1,237	32.1	2,207	57.2	3,855
1952–53	424	53.4	370	46.6	794	646	16.6	1,152	29.5	2,102	53.9	3,900
1953–54	518	57.7	380	42.3	898	783	22.3	1,005	28.7	1,716	49.0	3,504
1954–55	468	54.7	388	45.3	856	1,058	25.9	1,124	27.5	1,908	46.6	4,090
1955–56	452	52.3	412	47.7	864	1,205	28.2	1,113	26.1	1,951	45.7	4,269

Source: *Earned Degrees Conferred by Higher Educational Institutions*, U. S. Office of Education, Circulars 380, 390, 418, 461, and 490 (1951–52 to 1955–56).

[1] State colleges not authorized to grant doctorates.

number of doctorates rose from 793 in 1951–52 to 864 in 1955–56. Further information on the nature and sources of doctorates awarded in California between 1952–53 and 1955–56 is provided in Table 26. As would be expected the University of California and the three large private institutions account for practically all doctorates awarded—98.7 per cent.

The number of degrees awarded in four general areas of learning is also given in Table 26. Physical science, including engineering and mathematics, ranks second highest. Social science is first because education has been included, thus doubling the social science percentage. The humanities account for only 7.4 per cent of the total. It is interesting to note the specialization of California Institute of Technology in the sciences, and the University of Southern California in the social sciences and education. The University of California has a more even spread in the four general fields with the exception of the humanities, but even there it exceeds slightly Stanford University and the University of Southern California.

A more detailed analysis of the sources of doctor's and master's degrees awarded by the three segments of California institutions is presented in Table 27 which shows the number of degrees conferred in 24 subject fields for 1955–56. For example, all but one of the doctorates in agriculture were conferred by the University of California (Stanford conferred one degree in agricultural economics). In education, the load at the doctoral level is being carried largely by the private universities, and on the master's level by the state colleges and the private colleges and universities. Only the state colleges are providing graduate degrees in industrial arts—a field of considerable shortage for secondary schools.

Up to this point only actual data have been presented, but in Table 28 projections of the future total numbers of graduate degrees to be awarded each year to 1970–71 are presented by level of degree and by segment of higher education. These projections have been made on the assumption that, except for the state colleges, *the ratio of graduate degrees to total full-time enrollment would remain in the future, about the same as it was from 1950–51 to 1955–56.*[1] In the case of the state colleges, which were first authorized to grant master's degrees in 1949, the ratio of master's degrees to total enrollments was increased from 3.75 per cent in 1957–58 to 5.00 per cent in 1966–67 and then held constant. None of the newly authorized state colleges was included in these estimates.

An idea of how the California supply of doctoral degree holders, if they all entered higher education in California, would meet the estimated demand between 1957 and 1970 can be gained by multiplying the percentage of new appointees with doctorates as given in Tables 12, 17, 21, and 31 for each segment of higher education, by the total demand given in Tables 4, 5, 6, and 7. This calculation gives a total of 15,443 doctors needed for all four segments for the years 1957–1970. It is estimated that California will produce 19,909 doctors during that period, but only a part of these will enter teaching in higher edu-

[1] Ratios of past graduate degrees to past *graduate* enrollments in the University of California and the state colleges were computed, but this method gave no evidence of providing more accurate projections. Because there were no total graduate enrollment projections for all three segments, total enrollments were the bases used in the projections for all three segments.

TABLE 20

Distribution of Doctorates Conferred in California by Subject Areas and Institutions, for the Period 1952–53 to 1955–56

Institutions	Doctorates conferred in:					Totals	
	Humanities	Biological Sciences[1]	Physical Sciences[2]	Social Sciences[3]	Other fields	Number	Per cent of total
California Institute of Technology	0	20	253	0	20	273	8.0
Claremont Graduate School	0	2	0	16	4	22	0.6
College of the Pacific	0	0	0	1	4	5	0.1
Stanford University	85	40	238	320	45	729	21.1
University of California	91	435	551	602	239	1,862	54.6
University of Southern California	81	26	49	203	39	323	15.0
Subtotal	258	523	1,085	1,202	351	3,394	99.5
Other institutions[4]	...	....	.....	.....	....	18	0.5
Total	258	523	1,085	1,202	351	3,412	100.0
Per cent of subtotal by area	7.6	15.4	31.4	35.4	10.3		

Source: Earned Degrees Conferred by Higher Educational Institutions, U. S. Office of Education, Circulars No. 399, 416, 441, and 469 (1952-53 to 1955-56).

[1] Including Agriculture and Home Economics.

[2] Including Engineering and Mathematics.

[3] Including Education which accounted for 39 per cent of the Social Science total.

[4] The totals of the institutions enumerated in California are by theological institutions.

cation and only a part of the latter will do so in California. It appears that out of the total of 125,493 possible master's degree holders, as shown in Table 28, there will be sufficient potential for college faculty needs in most fields.

Further data are needed to translate the estimate of total supply of graduate degree holders to an estimate of true supply from California institutions available to teach in higher education in California. Table 29, prepared from data provided by departments in the State's public and private institutions offering doctoral programs, shows for 22 subject fields the doctorates reported by these departments for 1953–54, 1954–55, 1955–56 and the number of the holders who continued in or entered teaching in higher education. Column 3 in the table shows for the three-year period the percentage by fields of those who remained in or entered teaching in higher education. The range, as will be noted, is from 24.4 per cent in engineering to 100 per cent in journalism, with an average for all fields of 49.9 per cent.

Column 4 shows for comparative purposes the per cents entering higher education by field shown in the recent National Education Association study, *Teacher Supply and Demand in Colleges and Universities.*[9] The study indicated a total of 57.3 per cent of recent doctor's degree graduates engaged in college or university service. In general, the proportions by field entering higher education in the California study and the National Education Association study are approximately of the same magnitude. Comments on several of the fields showing substantial differences follow:

The California data in the field of agriculture is composed mainly of recipients of doctor's degrees in biochemistry and entomology and, thus, is not representative of the general field. The California data in the field of business is composed of a very limited sample. In the field of education the per cent entering higher education according to the California data is 42.6. The National Education Association study indicates that 64.2 per cent of Ph.D.'s in education and 56.4 per cent of Ed.D.'s engage in college or university service. When these per cents are weighted in terms of the number of respective Ph.D. and Ed.D. graduates reported in the N.E.A. study, the over-all per cent becomes 58.9. One possible explanation for the lower per cent found in the California study is the likelihood that a larger proportion of persons receiving doctor's degrees in education in California may enter public school service in district and county positions. The relatively high salary scales and high qualifications required in many districts, particularly for administrative positions, may attract more graduates in California than in many other states. Finally, it is noted that the California study shows a larger percentage entering higher education in chemistry than does the N.E.A. study, but a smaller percentage in engineering and physics.

Assuming that the three years shown in Table 29 are typical, by applying the average of the percentages to the number of doctorates produced in these fields, an estimate of the true supply of doctors from California institutions who become college teachers can be made.

[9] *Teacher Supply and Demand in Colleges and Universities, 1955–56 and 1956–57.* Washington, D.C.: National Education Association, Research Division, 1957.

TABLE 97

Number of Doctor's and Master's Degrees Awarded in California by Recipient of Higher Education and Subject Field, 1955–56

Subject field	Doctor's degrees			Master's degrees			
	University of California	Private colleges	Total doctor's	State colleges	University of California	Private colleges	Total master's
Agriculture	26	1	27	0	62	4	66
Arts and Crafts	2	0	2	40	83	50	173
Biological Sciences	61	33	94	18	55	39	112
Bus. Ad., Bus. Ed., & Commerce	0	2	2	40	99	54	193
Chemistry	42	35	77	0	16	17	33
Economics	27	10	37	0	22	21	43
Education	51	122	173	812	152	917	1,881
Engineering	20	41	61	0	134	383	517
English, Speech, & Drama, Art	27	10	37	49	34	91	174
Geology	15	7	22	0	24	32	56
German	3	5	8	0	8	1	9
History	15	14	29	3	29	25	67
Home Economics	2	0	2	0	11	0	11

Industrial Arts	0	0	0	43	0	0	43
Journalism	0	0	0	0	19	9	28
Mathematics	16	12	28	1	19	13	33
Music	3	7	10	38	3	55	96
Philosophy	7	2	9	0	0	4	4
P.E. and Health Ed.	0	0	0	48	42	7	97
Physics	44	31	75	1	46	16	63
Political Science	14	9	23	0	30	11	41
Psychology	21	18	39	47	18	35	100
Romance Languages	11	2	13	2	27	7	36
Sociology	6	3	9	2	11	12	25
Sub-total	413	383	796	1,144	954	1,803	3,901
All other fields	39	29	68	61	159	148	368
Totals	452	412	864	1,205	1,113	1,951	4,269
Selected fields as per cent of total	91.4	93.0	92.1	94.9	85.7	92.4	91.4
Per cent by segment	52.3	47.7	100.0	28.2	26.1	45.7	100.0

Source: *Earned Degrees Conferred by Higher Educational Institutions, 1955-56*, U. S. Office of Education, Circular No. 499.
[1] State colleges not authorized to grant doctorates.

TABLE 28

PROJECTED FUTURE SUPPLY OF DOCTOR'S AND MASTER'S DEGREES PRODUCED WITHIN CALIFORNIA BY SEGMENT OF HIGHER EDUCATION, 1957–1970

Year	Doctor's degrees			Master's degrees			
	University of Calif.	Private colleges	Total doctor's	State colleges	University of Calif.	Private colleges	Total master's
Actual[1]							
1950–51	365	362	727	301	1,486	2,508	4,295
1951–52	431	362	793	411	1,237	2,207	3,855
1952–53	424	370	794	646	1,152	2,102	3,900
1953–54	518	380	898	783	1,005	1,716	3,504
1954–55	468	388	856	1,058	1,124	1,908	4,090
1955–56	452	412	864	1,205	1,113	1,951	4,269
Estimated[2]							
1956–57	469	.....	.....	1,415	1,365	.....	.....
Projected[3]							
1957–58	534	449	983	1,601	1,450	2,218	5,269
1958–59	561	469	1,030	1,751	1,522	2,318	5,591
1959–60	590	490	1,080	2,032	1,600	2,419	6,051
1960–61	630	510	1,140	2,256	1,710	2,520	6,486
1961–62	684	530	1,214	2,673	1,857	2,621	7,151
1962–63	736	551	1,287	2,945	1,997	2,722	7,664
1963–64	789	571	1,360	3,388	2,141	2,822	8,351
1964–65	857	592	1,449	3,735	2,326	2,923	8,984
1965–66	908	612	1,520	4,261	2,466	3,024	9,751
1966–67	968	632	1,600	4,915	2,626	3,125	10,666
1967–68	1,033	653	1,686	5,375	2,804	3,226	11,405
1968–69	1,109	673	1,782	5,745	3,010	3,326	12,081
1969–70	1,155	694	1,849	6,135	3,136	3,427	12,698
1970–71	1,215	714	1,929	6,520	3,297	3,528	13,345
Totals: 1957–70	11,769	8,140	19,909	53,332	31,942	40,219	125,493

[1] From U. S. Office of Education Circulars.
[2] Based on preliminary data.
[3] Per cents of total full-time enrollment, based on actual experience, used to project number of doctor's and master's degrees by segment:
Doctors: University of California—1.26 per cent; private colleges—1.02 per cent.
Masters: State Colleges—3.75 per cent in 1957-58 to 5.00 per cent in 1966-67; University of California—3.42 per cent; private colleges—5.04 per cent.

Information on the percentage of master's degree holders who entered college teaching was not obtained from the academic departments of California institutions, but from replies from California college and university placement officers. It appears that in total approximately 13 per cent of the master's degree holders accept teaching appointments in higher education.

Supply of Teachers for California Higher Education

As indicated previously, not all who accept appointments in higher education do so in California. In order to obtain data on what the true supply for California might be, California college and university placement officers were asked to analyze their records for the year 1955–56. These analyses are summarized in Table 30.

Certain problems appeared in the preparation of this table. The first is that placements are made both by the subject departments and by the placement offices. Apparently, in neither place is a complete record maintained. The second limitation of Table 30 is that the records do not always show whether the placement is directly from graduate school or is a change from one college position to another. For these reasons, the Joint Staff concludes that the value of Table 30 lies chiefly in the in-state and out-of-state totals and the per cents derived from them. However, limited reliance may be placed on the data in subject fields in which there are a relatively large number of cases.

From Table 30 the conclusion is drawn that slightly over 50 per cent of the doctor's and 75 per cent of the master's degree holders from California institutions who enter college and university teaching do so within California. Thus, from the data available, the Joint Staff concludes that, on the average, of the total doctors produced in California, 50 per cent enter higher education (Table 29) and of this half, about 54 per cent accept a position in California. The true net supply of doctors from California institutions who will accept appointments on California college and university faculties, then, is on the average about 27 per cent of the total number of doctorates conferred in California.

Of the master's degrees conferred by California institutions, approximately 13 per cent of the holders enter higher education, and of these, approximately 77 per cent do so in California. Thus, the true supply of the total master's degree holders from California institutions and available for appointment to faculty positions in higher education within California is approximately 10 per cent of the total produced in the State.

Comparison of California's Demand with Supply

Table 31 sums up data related to the estimated demand for staff for California college and university faculties. For each of the four segments, the estimated total demand between 1957 and 1970 has been taken from Table 9 and is shown in Column 2 of this table. The assumed sources of supply whether in-state or out-of-state, are estimated on two bases:

Situation A assumes that the out-of-state sources will continue to provide the same per cent of California's college faculty members as for the years 1954 through 1956.

TABLE 29

PROPORTION OF RECIPIENTS OF DOCTORAL DEGREES FROM CALIFORNIA INSTITUTIONS WHO CONTINUED IN OR ENTERED HIGHER EDUCATION, BY SUBJECT FIELD AND YEAR, 1953–54 TO 1955–56

Subject field	1953–54		1954–55		1955–56		Total for 3-year period		Per cent entering higher education	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	This study	N.E.A.study[1]
Agriculture	8	4	[illegible]	2	14	4	30	10	33.3	65.9
Biological Sciences	71	35	[illegible]	35	74	40	202	110	54.4	68.9
Bus. Ad. & Bus. Ed.	1	0	3	2	2	2	6	4	66.7	82.6
Chemistry	74	33	66	30	61	14	201	77	38.3	27.6
Economics	16	14	27	22	42	32	85	68	80.0	76.2
Education	147	71	155	64	175	68	477	203	42.6	58.9
Engineering	74	19	70	18	61	13	205	50	24.4	36.8
English, Speech, & Dramatic Art	38	38	38	36	44	40	120	114	95.0	89.5
Geology	25	8	19	9	26	13	70	30	42.8	37.4
German	9	9	7	7	8	6	24	22	91.7	86.0

History	30	23	30	24	29	22	89	69	77.5	84.3
Home Economics	3	2	2	2	4	3	9	7	77.8	85.0
Journalism	0	0	1	1	2	2	3	3	100.0	100.0
Mathematics	30	18	37	27	27	22	94	67	71.3	73.3
Music	8	7	2	1	7	5	17	13	76.5	81.9
Philosophy	5	5	7	6	6	6	18	17	94.4	83.1
P.E. & Health Ed.	7	7	3	2	7	7	17	16	94.1	78.7
Physics	63	20	77	17	76	18	216	55	25.5	42.4
Political Sciences	15	11	13	11	20	13	48	35	72.9	78.7
Psychology	58	21	72	20	41	15	171	56	32.7	36.2
Romance Languages	9	9	13	11	15	14	37	34	91.9	86.0
Sociology	7	6	11	8	5	4	23	18	78.3	75.7
Totals	698	360	718	355	746	363	2,162	1,078		
Per cent entering higher education	51.6		49.4		48.6		49.9		49.9	57.3

Source: The materials for this table were secured directly from the departments of California institutions (both public and private) which offer doctoral programs. The number of doctorates reported is somewhat less than the 2,618 awarded in the three years both because of other fields not reported and incomplete reporting from some of the departments shown.

Note: Column 1: The total number of doctorates reported; Column 2: The number reported in Column 1 who continued in or who entered higher education.

[1] *Teacher Supply and Demand in Colleges and Universities*, National Education Association, Research Division, Washington, D.C., 1957, Table AG, p. 74, Column 4.

TABLE 30

PERCENTAGE OF PLACEMENTS OF CALIFORNIA'S GRADUATE DEGREE-HOLDERS IN COLLEGE FACULTY POSITIONS WITHIN- AND WITHOUT-THE-STATE BY DEGREE AND SUBJECT FIELD, 1955–56
(Based on limited data)[1]

Subject field	Number of placements of holders of doctor's degrees			Number of placements of holders of master's degrees		
	In-state	Out-of-state	Total	In-state	Out-of-state	Total
Agriculture	1	0	1	0	0	0
Arts and Crafts	1	0	1	12	9	21
Biological Sciences	9	11	20	6	2	8
Bus. Ad., Bus. Ed., and Commerce	2	2	4	14	1	15
Chemistry	6	2	8	7	0	7
Economics	3	1	4	3	2	5
Education	20	11	31	20	3	23
Engineering	1	2	3	6	0	6
English, Speech, and Dramatic Arts	18	12	30	38	9	47
Geology	0	0	0	2	1	3
German	1	5	6	2	5	7
History	13	14	27	12	5	17
Home Economics	0	0	0	6	1	7
Industrial Arts	0	1	1	0	0	0
Journalism	0	0	0	2	0	2
Mathematics	0	0	0	15	0	15
Music	0	1	1	4	4	8
Philosophy	2	1	3	0	1	1
P.E. & Health Ed.	3	0	3	14	5	19
Physics	1	1	2	8	0	8
Political Science	4	4	8	4	3	7
Psychology	4	5	9	9	1	10
Romance Languages	2	3	5	6	1	7
Sociology	3	5	8	2	5	7
All other fields	3	2	5	9	3	12
Totals	97	83	180	201	61	262
Per cent	53.9	46.1	100.0	76.7	23.3	100.0

[1] The data are based on replies to a Joint Staff questionnaire of June 24, 1957, sent to California college and university placement officers. Replies were received from 5 state colleges, 3 University of California campuses, and 10 private colleges and universities.

Situation B assumes that the out-of-state sources will supply 10 per cent less of California's needs than for the same years as in Situation A, thus requiring a corresponding 10 per cent increase in the supply provided from institutions within California.

Columns 3 and 4 show the per cent and number of faculty needed between 1957 and 1970 (Column 2) which are expected from out-of-state and in-state sources respectively. Columns 5, 6, and 7 show the per cent and number of faculty in Column 4 who will be expected to have the doctor's degree, master's degree, and other degrees respectively, at the time of appointment if the present ratio of these degrees to total degrees is maintained.

As will be noted in Situation A, Columns 5 and 6 of Table 31, California graduate schools, to meet the need, will have to produce between 1957 and 1970 an estimated 6,534 doctor's and 12,340 master's degree holders *who will enter college teaching within California either directly or eventually*. In Situation B, these numbers are increased to 8,078 and 14,256 respectively.

Table 32 shows an estimate of how close the California graduate schools may come to supplying the needs as estimated in Columns 5 and 6 in Table 31. A review of the following three assumptions basic to the estimates in Table 32 may be helpful:

1. Graduate school enrollments and degree production will at least maintain their present relationship to total enrollments. This means, on the basis of enrollment data in Table 3, a 240 per cent increase in the state colleges, a 157 per cent increase in the University, and a 65 per cent increase in private colleges and universities, between 1956 and 1970.
2. Sixty per cent of the doctor's and 13 per cent of the master's degree holders will either directly or indirectly enter higher education teaching in California or elsewhere.
3. Fifty-four per cent of the doctor's and 77 per cent of the master's degree holders who enter higher education teaching will do so in California.

By comparing Table 31, Columns 5 and 6, Situation A, with Columns 6 and 7 in Table 32, it appears that under the above conditions California graduate schools could prepare approximately the number of doctor's and master's degree holders needed from California to supplement the out-of-state supply on the present bases.

This balance between over-all demand for, and supply of, persons with doctor's and master's degrees who are available to enter higher education within California is possible only because of the operation of the two basic assumptions which underlie Tables 31 and 32:

(1) That the proportion of demand for faculty in California institutions which will be met from out of state will continue as in the past three years—about 43.5 per cent of total demand (Table 31).

(2) That California production of doctor's and master's degrees will keep pace with the increase in total enrollments and that the same proportion of doctor's and master's degree recipients will enter higher education teaching within California as in the past three years.

TABLE 31

Estimated Net Demand for Doctor's and Master's Degree Recipients from California Institutions Needed to Staff California Higher Education, 1957 to 1970

Segment of higher education	Total demand 1957-70[1]	Assumed sources of supply				Needed from within California by type of degree					
		Out-of-state		In-state		Doctor's		Master's		Other	
		Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number	Per cent	Number
(1)	(2)	(3)		(4)		(5)		(6)		(7)	
Situation A: Existing Proportion to be Supplied from Within California											
Junior colleges	15,620	16[2]	2,499	84[2]	13,121	6[2]	787	65[2]	8,529	29	3,805
State colleges	12,185	55[3]	6,702	45[3]	5,483	43[3]	2,358	47[3]	2,577	10	548
University of California	9,345	65[4]	6,074	35[4]	3,271	68[4]	2,224	17[4]	556	15	491
Privage colleges	5,294	60[5]	3,176	40[5]	2,118	55[5]	1,165	32[4]	678	13	275
Totals	42,444		18,451		23,993		*6,534*		*12,340*		5,119
Per cent		43.5		56.5		27.2		51.4		21.3	
Situation B: A 10 per cent Increase in Proportion to be Supplied from Within California											
Junior colleges	15,620	6	937	94	14,683	6	881	65	9,544	29	4,258
State colleges	12,185	45	5,483	55	6,702	43	2,882	47	3,150	10	670
University of California	9,345	55	5,140	45	4,205	68	2,859	17	715	15	631
Private colleges	5,294	50	2,647	50	2,647	55	1,456	32	847	13	344
Totals	42,444		14,207		28,237		*8,078*		*14,256*		5,903
Per cent		33.5		66.5		28.6		50.5		20.9	

Note: Column 2 is broken down into Columns 3 and 4 according to the percentages shown. Column 4 is then divided into Columns 5, 6, and 7 according to the percentages shown. The total shown in Column 5 is the net demand for holders of doctorates produced within California; the total of Column 6 is the net demand for holders of master's degrees produced within California.

[1] To meet the needs of both replacement and enrollment increases. See Table 9.
[2] See Table 21.
[3] See Tables 16 and 17, assuming in-state distribution of degrees is same as total.
[4] See Tables 11 and 12, assuming in-state distribution of degrees is same as total.
[5] Approximately one-half way between state college and University of California experience.

Although Table 32 indicates the possibility of an approximate balance between demand and supply *if* the above assumptions hold true, some indication of the job ahead for California graduate schools in fulfilling the second assumption is

TABLE 32

ESTIMATED NET SUPPLY OF HOLDERS OF DOCTOR'S AND MASTER'S DEGREES PRODUCED IN CALIFORNIA, WHO WILL ENTER HIGHER EDUCATION TEACHING WITHIN CALIFORNIA, 1957–1970

Segment of higher education	Gross supply produced in California[1]		Enter higher education		Net supply remaining within California	
	Doctor's degrees	Master's degrees	Doctor's 50 per cent[2]	Master's 13 per cent[3]	Doctor's 54 per cent[4]	Master's 77 per cent[4]
(1)	(2)	(3)	(4)	(5)	(6)	(7)
State colleges	.....	53,332	.....	6,933	.....	5,338
University of California	11,769	31,942	7,061	4,152	3,813	3,197
Private colleges	8,140	40,219	4,884	5,228	2,637	4,026
Totals	19,909	125,493	11,945	16,313	6,450	12,561
Degrees 1955–56	864	4,269	518	555	280	427
Degrees 1957–1970 at present production	12,096	59,766	7,258	7,770	3,919	5,983

Note: The gross supply of doctor's and master's degree-holders estimated to be produced within California during the period 1957–1970 is shown in Columns 2 and 3 by segment of higher education. The numbers are reduced in Columns 4 and 5 by the percentages shown to estimate the proportion under each degree level who enter higher education. Finally, the numbers in Columns 4 and 5 are further reduced in Columns 6 and 7 by the percentages shown to indicate the net supply under each degree level estimated to enter higher education within California. These should be contrasted with the comparable net demand figures shown in Table 31.

[1] See table 28.

[2] This figure is based on the 50% (49.9) of those receiving doctor's degrees who continue in, or who enter positions in, higher education directly from graduate school as shown in Table 29. In addition, an allowance of 10% is made for recruits from the "pool" of previously graduated doctoral degree-holders who on graduation entered research, industry, government, non-collegiate educational service, and other miscellaneous activities. A 10% allowance for this factor of indirect supply would seem conservative in view of the 28% shown in Table 13 for the University of California, and the 20% shown in Table 18 for the state colleges, of recruits from research, government, industry, and miscellaneous occupational sources (but not including non-collegiate educational service) into full-time college faculties.

[3] Based on replies from California placement officers from 8 public and 9 private institutions. No allowance is added for indirect entrance of master's degree graduates into higher education since the supply of doctor's degree candidates comes largely from the pool of master's degrees. The 11,945 persons with doctor's degrees estimated to enter higher education in Column 4 amount to an additional 9.5 per cent of total master's degrees. Thus, 13 per cent plus 9.5 per cent equals 22.5 per cent of master's degree recipients entering higher education directly or via doctoral programs.

[4] See Table 30.

needed. The bottom rows in Table 32 show the actual 1955–56 production of doctor's and master's degree holders by California graduate schools and the net number estimated to enter higher education teaching within California. The cumulative number of such degrees over the 14-year period 1957–1970 is shown as 3,919 doctor's and 5,983 master's if only present production is maintained. Thus, a 64 per cent increase in doctor's degrees, to 6,450, and a 110 per cent increase in master's degrees, to 12,561, would be needed in California to provide

the State's share of the supply its colleges and universities need between 1957 and 1970 as shown in Columns 6 and 7.

If the out-of-state supply should diminish by as much as 10 per cent, with the need for a corresponding increase of in-state production as shown in Situation B, Table 31, the production of doctorates by California institutions would need to be increased 106 per cent and the production of master's degrees increased 138 per cent. From an examination of the expansion plans of present graduate schools as shown in Table 34, it is apparent that some reassessments and coordination of these plans is needed if the State is to have adequate numbers of well-prepared faculty members.

There is the further point that need and supply by *individual* subject-matter fields must be examined and coordinated by appropriate departmental and graduate school personnel to insure that greatest expansion is planned in the fields of present and possible future shortage as nearly as these can be determined.

California's Supply and Demand by Selected Subject Fields

The present problems of faculty recruitment are not uniformly great for all the subject matter fields. The amount of variation in the balance of supply and demand is very difficult to quantify, but in order to obtain appropriate information from those best qualified to judge, the Joint Staff gathered data from administrative officers of the five University of California teaching campuses, ten California state colleges, 32 private California colleges and universities, 50 public California junior colleges, and one private California junior college; and from nine California college and university placement officers, and 25 placement officers (seven of these in private institutions) in 18 other states. These data are summarized in Table 33.

The following observations are based on their responses:

1. The subject fields in which there was a preponderance of agreement that there was an under-supply of staff in both 1956 and 1957 are business administration and business education, chemistry, engineering, geology, home economics, industrial arts, mathematics, and physics. Note for example, the fields of chemistry, engineering, and physics where not a single one of the respondents thought there was an oversupply in either year and only a very few thought they were in balance. Furthermore, these are fields in which the doctor's degree is considered highly desirable as a basis for college faculty appointment.

2. Subject fields in which a preponderance of the total respondents thought supply and demand for staff were approximately in balance in both years are: agriculture, arts and crafts, biological sciences, commercial arts, dramatic arts, economics, education, English and speech, German, journalism, music, philosophy, physical and health education, political science, psychology, Romance languages, and sociology.

3. Only in the field of history did a majority of the respondents think there was an oversupply of staff, and that only for the year 1956.

TABLE 33

OPINIONS EXPRESSED CONCERNING SUPPLY OF COLLEGE TEACHERS BY SUBJECT FIELDS SUMMARIZED FROM REPLIES TO AN OPINIONNAIRE SENT TO COLLEGE ADMINISTRATORS AND PLACEMENT OFFICERS IN CALIFORNIA AND CERTAIN OUT-OF-STATE PLACEMENT OFFICERS[1]

Subject field	In June 1956				In June 1957			
	Total replies	Per cent who thought this field			Total replies	Per cent who thought this field		
		Over-supplied	Balanced	Under-supplied		Over-supplied	Balanced	Under-supplied
Agriculture	50	4	62	34	59	5	53	42
Arts and Crafts	106	20	66	14	105	17	67	16
Biological Sciences	118	4	54	42	125	3	46	51
Business Ad. and Ed.	107	10	41	49	113	10	31	59
Chemistry	90	0	10	90	125	0	6	94
Commercial Arts	80	12	60	28	83	13	57	30
Dramatic Arts	101	30	59	11	112	25	58	17
Economics	114	9	61	31	117	9	58	33
Education	107	15	50	35	101	13	44	43
Engineering	103	0	8	92	106	0	8	92
English, Speech	127	26	57	17	127	21	53	26
Geology	102	1	42	57	106	2	33	65
German	108	26	63	11	105	20	67	13
History	123	52	42	6	124	45	46	9
Home Economics	98	2	26	72	99	3	23	74
Industrial Arts	82	1	31	68	85	4	24	72
Journalism	100	9	65	26	101	8	58	34
Mathematics	118	1	8	91	124	2	10	88
Music	115	38	54	8	109	34	52	14
Philosophy	111	23	71	6	110	17	74	9
P.E. and Health Ed.	96	25	52	24	94	17	51	32
Physics	125	0	6	94	125	0	6	94
Political Science	119	30	61	9	119	23	66	11
Psychology	124	21	49	30	128	17	50	33
Romance Languages	116	28	58	14	118	26	58	16
Sociology	119	12	65	23	115	9	69	22
Per cent of Total	...	16	47	37	...	14	44	42

[1] Replies were received from an administrative officer of: 5 University of California teaching campuses, 10 California state colleges, 32 private California colleges and universities, 50 public California junior colleges, 1 private California junior college, and from 9 California placement officers and 25 placement officers (7 of these in private institutions) in 18 other states.

Planned Expansion of Graduate Programs in California

The gross numbers of doctor's and master's degree recipients needed and the number of these expected to join the faculties of California's higher education institutions (Tables 31–32) do not give sufficiently sharp focus to the necessity for expansion in certain subject fields. Therefore, in order to indicate the expansion needed and to indicate how many of the seven institutions offering doctoral programs have expansion plans, Table 34 was prepared from a Joint Staff inquiry form filled out by the seven institutions in the State which awarded 99 per cent of the 1955–56 doctorates.

The number of doctorates produced by all California institutions in 1955–56 in the subject fields listed in Column 1 is shown in Column 2 of Table 34. Column 3 gives the percentage each field bears to the total number of doctorates (864) for these institutions in 1955–56. Column 4 shows the number estimated to be awarded in each subject field in the year 1970–71 if the same per cents are applied to the total number of doctorates anticipated for that year. The numbers in Column 4 will be large enough only in the departments where there is at present a balance or oversupply as indicated in Table 33. Column 5 indicates the subject fields currently undersupplied according to Table 33 and suggests the need for expansion beyond that indicated in Column 4. Columns 6 and 7 show, respectively, the number of institutions (or campuses) having graduate departments which confer doctorates in each of the selected fields, and whether or not departments in the seven institutions have expansion plans.

The implications of Table 34 will be valid insofar as the total national economy of 1970–71 proves comparable to the economic picture of the present. Any major decline, upsurge or shift in the economy between now and 1970 would undoubtedly affect these implications of adequacy, shortage or oversupply.

When an attempt is made to estimate with reasonable accuracy the amount of graduate expansion needed in any particular field in order to produce enough teachers to meet rising enrollments, it becomes apparent that adequate data, and knowledge of significant factors bearing on interpretation of data, are lacking. Rather, it appears that those concerned with graduate programs in each field should attempt to gauge their own needs for expansion.

Since the number of institutions offering graduate programs contributing significantly to collegiate teaching supply in any given field is relatively small, it would seem desirable that representatives from the departments concerned should together attempt to develop realistic plans for meeting the probable demand in their field based on the different amounts of expansion feasible in the several institutions. In order to do this, more complete and reliable data woud be necessary than is furnished in this study. The present study attempts to show only in broad outline the magnitude of demand for new staff in the several fields and the possibility of meeting that demand, providing California graduate departments plan concretely to expand where necessary to continue to produce their share of the total supply needed.

TABLE 34

NUMBER OF DOCTORATES NEEDED FROM CALIFORNIA INSTITUTIONS BY SUBJECT FIELDS IN 1970-71 AND CURRENT PLANS OF DEPARTMENTS FOR EXPANSION

Subject field	1955-56 doctorates produced in California[1]		Estimated California doctorates, 1970-71[2]	Fields undersupplied in 1957[3]	No. of institutions with graduate depts.[4]	
	Number	Per cent			Conferring doctorates	Planning expansion of dept.
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Agriculture	37	4.3	83		3	1
Arts and Crafts	2	0.2	4		..	..
Biological Sciences	94	10.9	210	x	7	5
Bus. Ad., Bus. Ed. and Commerce	2	0.2	4	x	3	1
Chemistry	77	8.9	172	x	7	3
Economics	37	4.3	83		5	1
Education	173	20.0	386		6	4
Engineering	61	7.1	137	x	4	4
English, Speech, Dramatic Arts	36	4.2	81		5	2
Geology	32	3.7	71	x	5	1
German	8	0.9	17		4	..
History	29	3.4	66		5	2
Home Economics	2	0.2	4	x	2	2
Industrial Arts	0	0.0	n	x	..	..
Journalism	0	0.0	n		1	..
Mathematics	28	3.2	62	x	6	3
Music	10	1.2	23		4	2
Philosophy	9	1.0	19		5	2
P.E. and Health Ed.	0	0.0	n		4	3
Physics	75	8.7	168	x	6	4
Political Science	23	2.7	52		5	3
Psychology	39	4.5	87		5	2
Romance Languages	13	1.5	29		5	1
Sociology	9	1.0	19		5	1
All other fields	68	7.9	152			
Totals	864	100.0	1,929		102	47

Note: "n" indicates that there is probably a need, but no data from Columns 2 and 3 to indicate its extent.

[1] See Table 27.

[2] See Table 28. A total of 1,929 doctorates produced within California is projected for 1970-71. This number has been distributed by field according to the 1955-56 per cents.

[3] See Table 33. In these fields there was 50 per cent or more opinion that the field was undersupplied in 1957, implying an expansion need *in addition* to normal projection.

[4] Includes University of California campuses at Berkeley, Los Angeles and Davis; California Institute of Technology; Claremont Graduate School; Stanford University; and University of Southern California—a total of seven institutions.

Some reduction in the need for expansion in the seven institutions which produce doctorates for higher education in California, could be obtained if: (1) a larger percentage of recipients of doctorates were to be induced to enter college teaching, (2) a larger percentage of these were to accept positions in California, (3) faculties were to consist of a larger percentage of master's degree holders, including more from state colleges, (4) additional departments and institutions were to develop doctoral programs designed primarily to prepare for college and university teaching, or (5) more appointments from out of state or from non-collegiate sources, or both, were to be made.

Chapter VI

SOME SUGGESTIONS FOR MEETING CALIFORNIA'S STAFF NEEDS IN HIGHER EDUCATION

Numerous suggestions have been and are being made on how to meet current and future staff needs in higher education. The *Second Report to the President* by his Committee on Education Beyond the High School introduces a list of such recommendations with the following words:

"The most critical bottleneck to the expansion and improvement of education in the United States is the mounting shortage of excellent teachers. Unless enough of the Nation's ablest manpower is reinvested in the educational enterprise, its human resources will remain underdeveloped and specialized manpower shortages in every field will compound. Unwittingly the United States right now is pursuing precisely the opposite course. Demands for high quality manpower have everywhere been mounting, but colleges and universities have found themselves at a growing competitive disadvantage in the professional manpower market.

"Our Nation, like the prodigal farmer, is consuming the seed corn needed for future harvests. The ultimate result could be disaster."[1]

Academic Department Suggestions

In the inquiry (mentioned earlier) which went to the heads of California college and university departments offering doctoral programs, there was a request for suggestions on how best to meet the future staff needs in higher education in California. Practically all responded to this question, some at considerable length. Undoubtedly, much thought had been given to this problem; as a consequence a wide range of suggestions was offered. However, the great majority of these center around a few headings. These suggestions as grouped, and the number of times each was made, are as follows:

Suggestions	*Number of Times Made*
1. Increased salaries for teachers in higher education	35
2. More subsidies for advanced graduate students	29
3. Lighter teaching loads with more opportunities for research	7
4. Different type of degree than the Research Ph.D. for teaching	5
5. More use of part-time specialists not connected with academic institutions	5

In the materials which follow, the Joint Staff has endeavored to bring together some suggestions which are believed to have merit and which, if applied, would contribute to the solution of the problem of providing qualified faculty in adequate numbers. From the data in Chapter V it appears that the greatest effort in implementing these suggestions should be directed toward increasing the supply at the doctoral level.

[1] *Second Report to the President,* Washington, D.C.: The President's Committee on Education Beyond the High School, July, 1957, p. 5.

How the Actual Supply of College Teachers May Be Increased

1. Through counseling in the high schools, junior colleges, colleges and universities, and with the assistance of community leaders and parents, bring to the attention of students the rapidly improving opportunities in the college teaching profession and the satisfactions which come from such service. To do this effectively, these counselors must have a continuous flow of well-organized and up-to-date materials from such agencies as the California State Department of Education, the National Education Association, the Association for Higher Education, the American Association of University Professors, the American Association for the Advancement of Science, the Association of Land Grant Colleges and Universities, the American Association of Colleges for Teacher Education, and the Association of American Universities.

In presenting to graduate students the opportunity in the college teaching profession to render a service which has great social significance, appropriate additional emphasis should be given to the so-called "fringe benefits" available to the college teacher. Among these benefits are pleasant, nonhazardous working conditions, congenial and stimulating associates, social and professional prestige, longevity of employment, security of position, generally adequate health benefits, rapidly improving retirement provisions, and in some institutions free tuition to children of faculty members.

2. Make use of the fact that college teachers can be very effective in recruiting their outstanding students for college teaching. One way is for them to implant the idea that their students will ultimately be worthy of being their colleagues. In the final analysis, the teachers of able students have more influence on the choice of careers than any other group with the possible exception of parents.

3. Secure more complete recognition on the part of the graduate schools of the nation of the large task ahead, particularly at the doctoral level, if the nation's colleges and universities are to be adequately staffed. The Joint Staff believes that the following quotation taken from an article entitled "Toward Recruiting College Teachers," by Ray C. Maul, Assistant Director of the Research Division of the National Education Association, is reasonably accurate in terms of this recognition:

"Moreover, unhappily, the graduate schools of the nation—the producers of future college teachers—have not yet made a frontal attack upon this problem. While a few are experimenting in the area of preparation for college teaching, there is far too little evidence that a seriously conceived inter-institutional approach is in early prospect. Even more discouraging, if possible, is the wide-spread lack of coordinated effort among the different departments and schools offering graduate work within a given university. All too frequently the student who has a serious interest in becoming a college teacher is subjected to sharply conflicting counsel as he attempts to plan a sound program of preparation."[2]

[2] Ray C. Maul, "Toward Recruiting College Teachers," *The Journal of Higher Education*, Vol. XXVII, Number 4, April, 1956.

4. Increase financial aid to students preparing for college teaching through scholarships, loans, fellowships, and college teaching internships, particularly for the doctorate, on a full-time or part-time basis. Examples of this kind of aid are found in both Illinois and Michigan where approximately half of the annual scholarship allotments are for teacher education. In New Jersey and Ohio the total allotments of state funds are for that purpose. In 1953, the Ohio Legislature appropriated $250,000 to cover the cost of this program for 1953–54 and $500,000 for 1954–55. Subsequently, a similar appropriation was made for the next biennium.

Another effort in this direction is the announcement by the Ford Foundation of a $25,000,000 appropriation for large scale extension and development of the Woodrow Wilson Fellowship Program. The Foundation's action will support a broad program to attract able college students into the academic profession and will provide fellowships to potential college teachers at the rate of 1,000 a year for the next five years.[3]

5. Provide greater flexibility in mandatory age retirement provisions so that persons who are mentally and physically fit may teach beyond those ages. An example of this flexibility is found in the University of California retirement system's provision for re-employment of retired faculty. As adopted in 1954, the Regents of the University established the program "in order to meet the progressive shortage of highly trained personnel and to utilize the abilities of mature members of the academic staff." Re-employment is selective, on a year-to-year or consultant-service basis, and "each candidate approved for re-employment shall undergo an examination by a physician or physicians approved by the Governing Board, one month before the semester or term in which he is to begin his re-employment service." As of October, 1957, 14 persons had been thus re-employed.

Another example of this is found in the "65 Club" at the Hastings College of Law in San Francisco, an institution affiliated with the University of California. The average age of the ten members of the 1957 full-time faculty of this college was 73 years and ranged from 68 to 81 years. Five of these ten were former deans of law schools in these universities: Cincinnati, Minnesota, Missouri, Pittsburgh and Cornell. All but two of the entire group had been retired because of age before coming to Hastings. In answer to the question as to how satisfactory the services of these persons are, David E. Snodgrass, Dean of the College, stated that the teaching effectiveness of these overage persons is very high and that they fit very well into the local situation.

The Joint Staff sees no valid reason why other departments, schools and colleges could not likewise profit from the services of qualified persons in good mental and physical health who have been retired because of age.

6. Recruit more full-time faculty and use more part-time persons from fields of employment related to teaching fields. To increase the ease of doing this, the accrediting agencies should be encouraged to de-emphasize the percentage of

[3] *News from the Ford Foundation*, April 4, 1957, 477 Madison Avenue, New York 22, New York.

college faculty with a doctor's degree as the principal measure of the quality of instruction, provided there are other evidences of quality.

7. Pay salaries to college teachers more nearly in keeping with those paid in business and industry to persons with similar qualifications. Again quoting from the *Second Report to the President* of his Committee on Education Beyond the High School:

"Over the last half century and especially since 1940, serious erosion has occurred in the real incomes of American college teachers relative to other professional groups and to wage earners generally. The greatest erosion has been at the highest ranks.

"To restore teaching to a competitive position in the professional labor market comparable to that which it occupied before World War II would require an average increase in faculty salaries of something like 75 to 80 per cent. And to maintain this position, once restored, would probably require by 1970 an average rise of 100 to 125 per cent above present faculty salary levels.

"The plain fact is that the college teachers of the United States, through their inadequate salaries, are subsidizing the education of students, and in some cases the luxuries of their families, by an amount which is more than double the grand total of alumni gifts, corporate gifts, and endowment income of all colleges and universities combined. This is tantamount to the largest scholarship program in world history, but certainly not one calculated to advance education. Unless this condition is corrected forthwith the quality of American higher education will decline. No student and no institution can hope to escape the consequences.

"The Committee recommends to every board of trustees, every legislature, and all others responsible for academic budgets:

(1) That the absolute highest priority in the use of available funds be given to raising faculty salaries, with the goal of doubling the average level within 5 to 10 years, and with particular attention to increasing the spread between the bottom and the top of each institution's salary structure." (pages 5–6)

8. Employ more women on faculties. College and university staffs are now largely made up of men. The Joint Staff knows of no objective evidence that as teachers men are superior to women. Consequently, staff supply could well be augmented by increase in the percentage of women teachers. Also greater use could be made of qualified persons retired early from military service, and from professional service in business and government.

9. Utilize minority group resources. Among the suggestions for the recruitment of staff in higher education, as made by the Educational Policies Commission of the National Education Association in its report entitled *Higher Education in a Decade of Decision,* is the following:

"*Minority Groups:* Among the members of minority groups in American Society are resources of education talent which have not been adequately tapped. Recruitment from among educated Negroes, Chinese-Americans, Nisei, and refugee groups from various countries, for example, is feasible and advantageous for many campuses. Vigorous search for qualified faculty talent among such groups not now fully represented on teaching staffs is clearly warranted."[4]

[4] *Higher Education in a Decade of Decision,* Educational Policies Commission, Washington, D.C., 1957, p. 89.

10. Provide adequate support for college and university placement services to handle personal files of out-of-state and non-academic persons qualified to teach.

11. Provide adequate funds for at least doubling the total capacity for producing doctor's degree holders in this state. Note should be taken of the relationship of supply and demand in the various subject fields as a basis for planning expansion in given departments and institutions.

Improvement in the Preparation of College Teachers

1. Strengthen the master's degree program so that it may be made more effective for educating beginning college teachers. The master's degree holders may be the source from which faculty can be recruited with greatest returns for effort invested. After employment, opportunity should be provided for those qualified to pursue an appropriate doctoral program.

2. Reorient the present doctoral programs, for those who plan to do college teaching as their major activity. The need for something to be done in this direction is pointed out in the report of the Committee of Fifteen which was created by the Fund for the Advancement of Education in the fall of 1954 to discuss certain critical problems of graduate schools. Quoted from the report is the following:

"Graduate schools, in their efforts to advance the boundaries of knowledge by research, are at present not paying sufficient attention to a function they inherited by a natural historical process—that of providing effective training for college and high school teachers; . . .

"If scholarly teaching is to survive in our colleges—and we believe that nonscholarly teaching simply isn't teaching—it should become the avowed purpose of graduate education to produce more people who are neither mere scholars nor unscholarly teachers, but scholar-teachers."[5]

3. Develop in the graduate schools an organized plan of instruction for those who will become college teachers, with perhaps 50 per cent of the time devoted to content in subject fields, 25 per cent in mastery of the teaching-learning process, and 25 per cent in action research of the type in which the college teacher is most likely to be engaged. A thorough knowledge of the subject is basic to successful teaching. Chances of success are further enhanced if the college and university teacher is also familiar with the principles basic to the teaching-learning process.

4. Implement the California plan for internships for college teaching positions. This plan was developed by a subcommittee of the Articulation Committee on University—State College Relationships. Briefly, the plan provides for internships either full-time or part-time in the state colleges for doctoral candidates in the University of California who are preparing for college teaching. Private universities should be invited to participate also.

[5] F. W. Strothmann, *The Graduate School Today and Tomorrow*, Written on behalf of the Committee of Fifteen, Fund for the Advancement of Education, New York, 1955. 42 pp.

Retention and Better Utilization of Faculty

1. Recognize through adjustments in the conditions of faculty promotion and advancement where needed, that good teaching is as important in college and university programs as are research and publication. Reward good teachers in faculty assignment, promotion, and salaries in a manner similar to recognition for research and publication.

2. Encourage and assist staff members to vitalize their instruction and at the same time add to their incomes by summer or supplementary employment in business or industry related to their fields of teaching.

3. Co-operate in such campaigns as that begun in April, 1957, by the Advertising Council, Inc., which is designed "to create in the American public a greater awareness of its stake in our institutions of higher learning and to stimulate it to provide increased financial support for them." This campaign will involve all major media—newspapers, magazines, radio, television, transit bus cards—and is sponsored by the Council for Financial Aid to Education. All time and space will be contributed by the media or paid for by business advertisers. The advertisements will be created without charge by one of the country's leading agencies.

4. Recognize the importance of morale by making assignments as compatible as possible with the desires, abilities, and experience of faculty members.

5. Employ assistants to perform the more routine aspects of teaching that are now required of faculty.

6. Let management "manage" and not burden faculty members with committee work of a routine and repetitious nature. This does not mean, however, that faculty members should have less participation in policy formation, but rather that the participation should be more efficient. This point is well stated in the following quotation from the April, 1956, issue of the *Journal of Higher Education*, page 218.

> "If faculty energy and talent are to be best utilized, they must be channeled in the direction where they are most effective. Therefore if x number of hours per week are spent by the professor in the performance of clerical, committee, or other unspecialized work, it is proper to ask if this number of hours might not be redirected toward teaching or research.
>
> "Raising this question implies certain policy considerations. In the first instance, the entire committee structure of an institution needs to be evaluated from the viewpoint of its educational significance. It is more than likely that such an evaluation would reveal not only numerous committees, at all levels, that contribute little of educational significance, but many that duplicate each other or work at cross-purposes. As a first step in such an evaluation, every committee might be required to state its explicit function. Some would find this extremely hard to do. It seems reasonable to suppose that at each administrative level it would become evident that the purposes of the specific unit would be better served by the consolidation or elimination of many existing committees."

7. Secure greater exploitation of and experimentation with mechanical aids to teaching, such as audio visual aids, including motion pictures and closed circuit

television. In connection with the use of closed circuit television, preliminary results in direct teaching by this method in Pennsylvania State University were reported at the Twelfth National Conference on Higher Education in Chicago, in March, 1957. This experiment, begun in 1954, has included 18 courses in a wide range of subjects offered to more than 4,000 students. At the time of the report a total of 15,000 students had participated in the experiment either through having received instruction directly by closed circuit television or by having been in the control sections. The following statement is quoted from the report on this experiment:

"The research findings to date show that there is no significant difference in student achievement between face-to-face and televised instruction, which is widely adaptable and generally accepted by both teachers and students. From an operational standpoint, closed-circuit instruction has been found practical and, under certain circumstances, economical in the saving of faculty time."[8]

San Francisco State College, San Jose State College, San Diego State College, and Chico State College are giving some college courses for credit via either open or closed circuit television. Some experimental work in teacher education via television versus laboratory school observation is being conducted in San Diego State College.

8. Examine constantly the actual and necessary teaching demand, paying particular attention to:

a) Avoiding unnecessary course proliferation with its consequent reduction in class size.

b) Minimizing the number of repeated courses with low enrollments, and minimizing the number of very small classes.

c) Avoiding fragmentation of curricula especially in cases where specialization may be a responsibility of industry or business rather than of higher education.

9. Strengthen counseling programs so that students may evaluate themselves and set their educational and vocational objectives with more clarity. Better motivation of learning and greater economy in student use of educational facilities and staff time will thus be effected. The objective of a program of counseling should be the full utilization of human resources

10. Place more responsibility on the students themselves for their own education. Clarence Faust, Vice-President of the Ford Foundation and President of the Fund for the Advancement of Education, comments as follows on the manner in which students are treated in our colleges and universities in an article in the April, 1957 issue of *The Key Reporter,* entitled "Rising Enrollments and Effective Use of Faculty Resources":

"We have for one thing long lamented the practice of 'spoon-feeding' in our colleges. Nothing seems so much to impress foreign scholars who visit institutions of higher

[8] *Current Issues in Higher Education, 1957: Proceedings of the Twelfth Annual National Conference on Higher Education,* National Education Association, Association for Higher Education, Washington, D.C., p. 69.

education in this country as our failure to put sufficient real responsibility on undergraduates for their own education. As one visitor put it a few years ago, 'You seem to deal with college students as they have been dealt with in high school and even earlier. You require regular class attendance and the performance of routine assignments, and you seem to assume that an undergraduate can learn only as a member of a group taking a course together.'"

In the same article, Dr. Faust suggests three types of study well worth exploring as a means of making more effective use of college teaching resources. These are:

a) Reduce the number of hours of formal instruction required in a course.

b) Arrange for students to do the work of a course without any formal class sessions. Instead of each student covering the same ground on the basis of reading lists and a syllabus, each might work his way into and through a subject along the line of a special interest in it. Properly developed comprehensive examinations might ensure adequate appraisal of his achievements.

c) Establish a four-quarter academic year with the provision that each student should be in residence for either the first and third quarter or the second and fourth, thereby giving one quarter to vacation or earning money and one quarter to independent study out of residence. This plan would enable an institution to increase considerably the number of students it handles. Also it would save substantial amounts of faculty time.

The Joint Staff realizes that the foregoing list of suggestions is not complete. It is hoped that the suggestions will stimulate local faculties to explore these and other possibilities which can best be adapted to their own institutions.

Chapter VII

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purposes of this study as indicated in Chapter II were to find answers in part at least to certain questions there listed. Concerning these questions, the Joint Staff has come to certain conclusions and recommendations. Before presenting these, however, there are listed below a number of findings summarized from the body of the report.

Summary

1. The total college-age population in California in 1973 is estimated at 2.79 times what it was in 1950. (Table 1)

2. According to a 1950 study of student migration, the number of California residents attending out-of-state institutions is about balanced by the out-of-state students attending California institutions. (Page 3)

3. Full-time college enrollment in public and private institutions in California is expected to be 3.11 times as large in 1970 as it was in 1950. (Table 3)

4. The size of staff in publicly controlled institutions of higher education in the United States in 1965 is expected to be slightly less than twice its size in 1955. The expected increase in staff in private institutions is 45 per cent.[1] (Table 2)

5. The number of new full-time-equivalent staff needed in California between 1957 and 1970 for each of the four segments of higher education is estimated as follows:

a) Junior colleges	15,620
b) State colleges	12,185
c) University of California	9,345
d) Private colleges and universities	5,294
Total	42,444

The above estimates include additions to faculty necessitated by enrollment growth, retirement, resignation, death, and separation from service for other causes. (Tables 4–10)

6. For the years 1954 to 1956 inclusive, 65.3 per cent of the 412 full-time academic appointments made to the faculty of the University of California resided outside California at the time of appointment. In addition there are the following facts regarding the 412 appointees:

a) 67.4 per cent held doctor's degrees exclusive of the M.D.,
b) 39.8 per cent were appointed at the rank of instructor,
c) 47.6 per cent were appointed at the rank of assistant professor,
d) 35.9 per cent came from graduate schools and 35.9 per cent came from other teaching positions. (Tables 11–15)

7. For the years 1954 to 1956 inclusive, 54.4 per cent of the 1,188 full-time appointments made to the faculties of the state colleges resided outside Cali-

fornia at the time of appointment. In addition there are the following facts regarding the 1,188 appointees:

a) 42.9 per cent held doctor's degrees,
b) 26.3 per cent were appointed at the rank of instructor,
c) 68.1 per cent were appointed at the rank of assistant professor.

An analysis by years shows an upward trend in the per cent of new appointments at the assistant professor level and a downward trend in those appointed as instructors.

d) 9 per cent came from graduate schools and 71.4 per cent from other teaching positions. (Tables 16–20)

8. For the academic year 1957–58 about 16 per cent of 457 new appointments to the faculties of California public junior colleges resided outside California at the time of appointment. In addition, there are the following facts regarding a total of 589 new appointees:

a) 6.3 per cent held doctor's degrees,
b) 65.0 per cent held master's degrees,
c) 77.6 per cent came from prior teaching positions. (Table 21)

9. In the nine-year period 1948–1956, 47 institutions of higher education in the United States each conferred more than 300 earned doctorates. Seven of these institutions are located in the western states. (Table 22)

10. From 1951–52 as compared to 1955–56, the annual production of doctor's degrees in the United States increased from 7,683 to 8,903, but that of master's degrees decreased from 63,471 to 59,440. In California for the same years, the production of doctor's degrees increased from 793 to 864, and that of master's degrees increased from 3,855 to 4,269. (Table 23)

11. In 1956 California's population was approximately eight per cent of the United States as a whole. During the period 1954–1956 inclusive, California institutions, in relation to the total in the nation, awarded doctorates in excess of the State's per cent of the nation's population in these subject fields: biological sciences, economics, education, engineering, geology, German, history, mathematics, physics, political science, and Romance languages. (Table 24)

12. During the period 1951–52 through 1955–56, private institutions awarded the largest percentage of master's degrees in California (57.2 per cent in 1951–52 and 45.7 per cent in 1955–56). The state colleges produced 10.7 per cent of the master's degrees in 1951–52, and 28.2 per cent in 1955–56. The percentages for these two years for the University of California were 32.1 and 26.1 respectively. (Table 25)

13. Of the doctorates awarded by California institutions during the period 1952–53 through 1955–56, 54.6 per cent were conferred by the University of California. The University of California and three private institutions account for 98.7 per cent of all doctorates awarded in California during that period. (Table 26)

14. Between 1952–53 and 1955–56, 31.4 per cent of the doctorates in California were conferred in the physical sciences, engineering, and mathematics; 35.4 per

cent in the social sciences, one-half of which were in education. The biological sciences, including agriculture and home economics, accounted for 15.4 per cent and the humanities for 7.4 per cent. (Table 26)

15. Based on the assumption that graduate degrees conferred will bear in the future the same relationship to total enrollments, in the three segments of higher education providing graduate programs, as they have in the past, it is estimated that the University of California will produce about 11,800 doctorates between 1957 and 1970. The estimate for private colleges and universities for the same period is approximately 8,100. During this same period, it is estimated that the state colleges, the University of California, and the private institutions will award respectively 53,300, 31,900, and 40,200 master's degrees. (Table 28)

16. While the percentage of doctor's degree recipients from California institutions who continued in or entered teaching in the several fields of higher education varied from 24.4 to 100 per cent during the period 1953–1956 inclusive, the average for all fields was approximately 50 per cent. From the evidence supplied by California college and university placement officers, it appears that 13 per cent of master's degree holders enter teaching in higher education. (Table 29)

17. Of these degree holders from California institutions who entered teaching in higher education, approximately 50 per cent of the doctors and 75 per cent of the masters did so in California. (Table 30)

18. If the rest of the nation continues to provide the same percentage of California's collegiate faculty as in the years 1954 through 1956, and recruitment from other than collegiate teaching sources (research, industry, government, non-collegiate educational service, and miscellaneous) is estimated as 10 per cent of appointments, California will need to produce a number of graduates sufficiently large so that the net supply produced in her own institutions will be 6,534 doctor's and 12,340 master's degree holders between 1957 and 1970. If the out-of-state sources should be reduced to meeting approximately 34 instead of the present 44 per cent of California's total needs, and recruitment from other than collegiate teaching sources proves to be not more than 10 per cent of the appointments, the number of doctors needed from California institutions to enter higher education teaching within California is estimated to be 8,078 between 1957 and 1970, and the number of masters needed is estimated at 14,256. If the present rate of production of advanced degrees in California institutions continues to increase in proportion to total enrollments, it is estimated that the various departments can supply 6,450 doctor's degree holders and 12,561 persons with a master's degree between 1957 and 1970 as teachers in California institutions. (Tables 31–32)

19. Opinions expressed by 132 college administrators and placement officers indicated an undersupply of college staff in both 1956 and 1957 in the following subject fields: business administration and business education, chemistry, engineering, geology, home economics, industrial arts, mathematics, and physics. (Table 33)

20. It appears that less than half of the selected departments have taken steps toward solving the problem of providing adequately trained faculties, particu-

larly at the doctoral level, in sufficient numbers to teach California's future college enrollments. (Table 34)

21. A number of suggestions have been offered for meeting California's staff needs in higher education. These suggestions generally fall in three categories: increasing the actual supply; improving the preparation of college teachers; and retention and better utilization of faculty.

Conclusions

In view of the foregoing and other related materials, the Joint Staff has come to these observations and conclusions:

1. The two major assumptions determining the relative balance of demand and supply in this study have been:

   a) That the proportion of demand for faculty for California institutions which will be supplied from out of state will continue as in the past three years at about 44 per cent of total demand (Table 31).

   b) That California production of doctor's and master's degrees will keep pace with the increase in total college enrollments, and that the same proportion of doctor's and master's degree recipients will enter higher education positions within California as in the past three years.

These two assumptions have resulted in an approximate balance of supply and demand as indicated in Tables 31 and 32. However, such an over-all balance may not apply to certain subject fields in which there are present shortages or in which future shortages may develop.

2. In the light of the expected increase in college enrollment generally throughout the nation, and the consequent increase in staff needs, the proportion of higher education staff recruited outside California in the years ahead may be reduced. (For the years 1954 to 1956 inclusive, 65 per cent and 55 per cent, respectively, of the newly appointed full-time staff in the University of California and the state colleges, resided outside California at the time of appointment.)

3. In order to validate Assumption (b) above, and to take into account Conclusion 2, California institutions which offer graduate programs must increase their output if the expected enrollments in the State are to be taught by competent and adequate staff. This is particularly true in certain fields where education, government, business and industry compete for their graduates. The winner in this competition seems to be the agency which offers the best opportunities in terms of salary, promotions, travel, and other similar awards.

4. While this study presents no data directly on the point, from the replies submitted from heads of the academic departments, the Joint Staff believes that graduate departments, if provided sufficient staff and facilities, can greatly increase their output without necessarily lowering the quality of their graduate programs and thereby lessening the value of degrees conferred.

5. The major conclusion which the Joint Staff wishes to emphasize is the task of the graduate departments in the State in making the second assumption (1b) come true. To expand the production of doctor's degrees and master's degrees

in the same proportion as the increase in total enrollments will be a task requiring wise planning, bold action, and adequate support from administrative and legislative bodies. In addition, more adequate and reliable data are needed by subject field so that the complex factors of supply and demand by degree level and by geographic and occupational source may be more carefully studied. This suggests that immediate evaluation and planning is needed at the departmental and institutional level to refine the data explored in this study. Finally, a reappraisal at the State level of the number of graduate degree recipients available for college and university faculty appointments should be made within the next few years based on improved procedures and more adequate data.

Recommendations

1. Graduate schools and departments in California institutions make every effort in cooperation with interested citizens and groups, to acquaint the public in general, and potential candidates for college teaching in particular, with the dignity and worth of the teaching profession and with the needs of California in that respect. Further, that graduate schools and departments in California institutions take the initiative to request sufficient staff and facilities to expand their programs, particularly at the doctoral level, to meet the State's responsibility for providing needed college and university staff. The Legislature, governing boards and others responsible for academic budgets likewise have a responsibility to grant such justified requests.

2. In order that more complete and adequate data may be available for studies such as this one, graduate schools, departments, and placement offices make follow-up studies on their graduate-degree recipients to determine, among other things, how many enter college and university teaching and in what institutions they do so.

3. Encouragement be given to the U. S. Office of Education, the American Council on Education, the National Education Association, or some other national body, to collect comparable data on such items as sources of supply, characteristics of new faculty appointees, and estimates of demand for faculty by subject fields.

4. The State Department of Education request from the junior colleges data on the characteristics of their new appointees. These data should be comparable to those for the state colleges and University as presented in Chapter IV of this study. Similar data from private colleges and universities would help complete the picture of collegiate staff needs. The Association of Independent California Colleges and Universities might initiate such a project.

5. A study be conducted to determine the effect which recruitment of college faculty members from other teaching positions has on the total supply of college teachers or upon the personnel problems of junior colleges and high schools, particularly within California.

6. Inasmuch as more complete and adequate data may change the estimates of staff needs and better disclose the sources from which these needs will be met, the results of this study be re-examined in 1960, such re-examination to pay

particular attention to the output of doctor's degree holders by California institutions in relation to the needs of the State, and meanwhile all interested persons be encouraged to comment on the present study and to make written suggestions to the Joint Staff for the proposed re-examination.

7. Finally, appropriate implementation of the foregoing recommendations be a direct concern of the Liaison Committee of the Regents and the State Board of Education, such implementation to be channeled through the existing coordination machinery and then brought to the Regents and the State Board of Education for final action.

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